



**US Army Corps  
of Engineers®**  
Savannah District

# **Hartwell Lake Draft Integrated Water Supply Storage Reallocation Report and Environmental Assessment and FONSI**

## **South Carolina and Georgia**

### **Appendix F: Correspondence with Requestors and Vertical Team**



**March 2024**

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998 Hunters Trail Anderson, SC 29625  
Phone: 864-332-6534 Fax: 864-224-6116

March 20, 2011

Mr. Virgil G. Hobbs III  
Operations Manager  
U. S. Army Corps of Engineers – Hartwell Lake  
2625 Anderson Highway  
Hartwell, Georgia 30643

Re: Reallocation Request

Dear Mr. Hobbs:

As a follow up to our previous discussions, Anderson Regional Joint Water System (ARJWS) respectfully requests your consideration of the following:

1. Renew the current allocation of 24,620 acre-feet based on the previous contract (Contract No. DACW21-67-C-0011) dated June 2, 1967. This contract expires in January 2018.
2. Reallocate an additional volume of 12,500 acre-feet to Anderson Regional Joint Water System, and
3. In calculating withdrawal rates, give consideration to return flows. A portion of the water withdrawn is returned by ARJWS customers who utilize the Six and Twenty Wastewater Treatment Plant (WWTP), Clemson-Pendleton WWTP, The City of Clemson's Cochran Road WWTP and Clemson University's WWTP.

Our engineer, Design South Professionals, Inc., will be preparing support documents to assist you in this effort. Please contact Design South's project manager, David Scott, at 864-226-6111, or by email at [davids@dsouth.com](mailto:davids@dsouth.com) if you have questions.

Thank you for your consideration of our request. We look forward to working with you and your staff on this important matter for Anderson Regional Joint Water System.

Sincerely,

  
Scott Willett  
Executive Director

Cc: David Scott



Joseph J. Tankersley, P. E.  
Jorge E. Jiménez, P. E.  
Charles D. Drown, P. E.  
Stacey W. Gordon, P. E.  
Frank W. Byne, P. E.  
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October 13, 2011

Mr. George O. Bramlette, Operations Manager  
US Army Corps of Engineers, Savannah District  
Hartwell Project Office  
P. O. Box 278  
Hartwell, Ga. 30643

RE: Water withdrawal from Lake Hartwell

Dear Mr. Bramlette:

We are writing you on behalf of the City of Lavonia to request guidance to obtain the USACE's issuance of an allocation to the City to withdraw additional water from Lake Hartwell. The City needs to increase its withdrawal from the Lake to meet the water needs of the citizens of Lavonia, Franklin and Hart Counties that the City serves. The City currently has a contract with the Corps of Engineers (DACW-21-7-89-1433) for a small water withdrawal. It is also using a sizeable portion of Hart County's allocation, processing the water and delivering it to Hart County and its other customers. We anticipate Lavonia's need for a 3.0 to 4.0 mgd withdrawal. The present treatment plant capacity is 3.0 mgd and is scheduled to be expanded to 6 or 7 MGD within five years. Lavonia's existing Hartwell raw water pumping station maximum capacity is 7.0 mgd with some improvements.

The City's historical water source was Crawford Creek Reservoir. It has been extremely stressed during the last several years and the issue of watershed protection may relegate this source to secondary use. The City's Ga. E. P. D. withdrawal permit for Crawford Creek Reservoir is 1.5 MGD. The City has been permitted by Ga. EPD to withdraw 3.0 MGD from Hartwell Reservoir. Lavonia is not allowed to withdraw both at the same time. The Treatment Plant is permitted for a present production capacity of 3.0 MGD. We are targeting an addition of 4 MGD at the plant. From previous correspondence (April 12, 1999) to the City we understand the following information is needed:

1. A copy of the Georgia Water Withdrawal Permit.
2. An assurance letter in reference to funding availability to pay for the allocation.
3. A needs report justifying the withdrawal request.
4. An alternatives cost effective analysis.
5. Report on the water withdrawn returned to the basin.
6. A life cycle cost of most likely alternative to the lake withdrawal.
7. Confirmation that no additional structures need be constructed for the withdrawal.
8. A study to determine any adverse environmental impacts resulting from this action.

We are compiling this information for submittal. Please let us know what additional information may be needed at this stage in the process. If the Corps has specific guidelines for the process, we would appreciate it if you could make them available to us. Your consideration in this matter is appreciated. If you have any question in this regard, please let us know.

Sincerely,

ZIMMERMAN, EVANS & LEOPOLD, INC.

Jorge E. Jiménez, P. E.  
Principal

Cc: Hon. Ralph Owens, Mayor

Mr. Gary Fesperman, City Manager

## PIONEER RURAL WATER DISTRICT

5500 West-Oak Highway  
P. O. Box 203  
Westminster, SC 29693-0203

Phone #: (864) 972-3082

### Board of Directors

Michael W. Foster, Chairman  
Clayborn E. Durham  
Robert A. Reeves, Jr.  
Jerry A. Barlow  
Barry J. Stevenson

February 16, 2010

Mr. Virgil G. Hobbs III  
Operations Manager  
U. S. Army Corps of Engineers – Hartwell Lake  
2625 Anderson Highway  
Hartwell, GA 30643

Re: ***New Lake Hartwell Water Treatment Plant***

Dear Mr. Hobbs:

As a follow-up to our initial letter of inquiry (copy attached) and our discussions with your staff, Pioneer Rural Water District officially requests that the U. S. Army Corps of Engineers reallocate storage in Hartwell Lake equivalent to a withdrawal capacity of 5 million gallons per day (MGD) for water supply purposes. We intend to construct a new water treatment plant (WTP) near the lake and utilize the lake as a raw water source. In addition, our service area is part of the Savannah River basin, so interbasin transfer is not an issue.

Further, Pioneer officially requests that an easement be granted for the purpose of constructing a raw water intake, pump station, access road, raw water transmission main and related appurtenances on Corps lakefront property. We are in the process of acquiring property south of I-85 Exit 2, on the Tugaloo River arm of the lake, on which to locate the water treatment plant. Thus, the requested intake and pump station site will be in this general vicinity. As our site acquisition efforts progress, we would like to work with you concurrently on obtaining the aforementioned easements.

We have enclosed a copy of the April 2009 *Water Treatment Plant Study and Site Selection Report* for your review. The study contains information equivalent to the required "Justification Report" that provides alternatives and financial analyses showing that constructing a WTP is in the best interest of Pioneer. Our engineering consultant, Design South Professionals, Inc., will be preparing the necessary permit and easement documents, including the draft Reallocation Report, Environmental Assessment, and Sections 404 and 10 permits for the project, and will submit them to you upon completion. Please contact Design South's project manager, Josh Fowler, at 864-226-6111, or by email at [joshf@dsouth.com](mailto:joshf@dsouth.com) if you have any questions.

Thank you for your consideration of our request. We look forward to working with you and your staff on this important project for our District.

Sincerely yours,

**Pioneer Rural Water District**



Michael W. Foster  
Chairman



Terry L. Pruitt  
General Manager

TLP:tlp

c: Van Cato  
Darryl Broome  
Josh Fowler



October 24, 2011

George O. Bramlette  
Hartwell Lake Operations Manager  
Hartwell Lake  
5625 Anderson Highway  
Hartwell, Georgia 30643

Dear Mr. Bramlette,

Landology Hartwell, LLC (parent company of Real Property Holding – Toccoa, Ga, LLC that owns Currahee Club Golf Course Development located in Toccoa, Georgia) understands that US Army Corps of Engineers manages Lake Hartwell and owns certain property that is adjacent to Currahee Club (commonly referred to as Stephens County Park). Landology Hartwell, LLC representatives have been in discussions with US Army Corps of Engineers regarding potential industrial usage of Hartwell Lake water for irrigation of Currahee Club. We appreciate the terrific job that the US Army Corps of Engineers has done in educating Landology Hartwell regarding the available options and process for an industrial water usage request. Landology Hartwell, LLC appreciates the comprehensive and collaborative approach that is required for an approval of a water reallocation, raw water intake pump system at the Old Highway 123 Fishing Bridge, and the associated matters.

Secondly, Landology Hartwell, LLC requests US Army Corps of Engineers' consideration of a Hartwell Lake water reallocation of storage sufficient to provide 1 MGD for industrial water use, an easement for the construction and operation of a raw water intake pump system at the Old Highway 123 Fishing Bridge, and a raw water transmission line and related appurtenances through US Army Corps of Engineers property.

Thirdly, we believe it is important to highlight that Currahee Club follows agronomy and irrigation best-management practices such as strict irrigation control mapping, application methods and other measures associated with water conservation. Currahee Club's average irrigation water volume is 0.5 MGD during the growing months (typically mid April through mid September) with peak water volume of 1+ MGD during chemical and fertilizer applications and prolonged excessively dry hot periods. Your Corps staff may find it helpful to know that Currahee Club is a very large golf course that occupies 262.52 acres. This course is approximately 175% larger than the average golf course acreage of 150 acres.

Fourthly, Landology Hartwell LLC will research the Highway 123 Fishing Bridge Historic Register eligibility and if an ancillary water structure would impact current eligibility.

Lastly, Currahee Club's engineering firm, Hayes James has developed preliminary design options for the industrial grade enclosed raw water intake pump system and the raw water transmission line for consideration by US Army Corps of Engineers. We look forward to collaborating on the design and engineering options with your Corps team.

In closing, I wish to thank you again for your office's very professional and courteous relations with the Landology Hartwell LLC team.

Respectfully submitted,



William G. Slagle  
Member of the Board  
Landology Hartwell, LLC

cc: Sandy Campbell, Chief Ranger, Shoreline Management



March 30, 2015

Mr. Tom Jester  
Department of Army  
Savannah District, Corp of Engineers  
100 West Oglethorpe Avenue  
Savannah, Georgia 31401-3604

Re: CURRAHEE CLUB

Dear Mr. Jester,

Enclosed please find our response to your letter dated October 31, 2014 for water reallocation from Lake Hartwell for irrigation of our golf course. We have answered the questions with the information available to us within the current time frame.

Please review and comment our request for water reallocation. Should you need any additional information please let me know. Thank you for your assistance in this matter.

Sincerely,

Tom Rodgers  
Director of Development



## Currahee Club Water Needs Analysis

### Acknowledgement

Currahee Club previously submitted a request for a water withdrawal permit from Lake Hartwell, to which the Corps responded in an October 2014 initial review letter. Currahee Club has developed a response and modified application, presented below. This update reduces the request from 1,000,000 GPD down to 500,000 GPD, based on needs modeling conducted using Toro-SitePro Irrigation software. The assessment also presents an alternatives analysis including annualized costs.

### Currahee Club Water Needs / Summary of Proposed Project

Currahee Club, throughout the entire lifespan of its irrigation pumps (May 2001 to present), has used an average of approximately 200,000 GPD of water in peak season (May to September) to sustain the turf and landscape within the development. This time span includes a significant drought experienced from 2007-2009 as well as a year of record rainfall in 2013.

A series of irrigation ponds were developed on Currahee Club property to irrigate the golf course and common areas; the ponds are sourced from 1) groundwater irrigation wells, 2) site stormwater runoff, and 3) a water line from the City of Toccoa water system. During times of drought the groundwater wells and stormwater runoff are not sufficient to meet demand; the ponds need to be supplemented by alternative means. Thus, Currahee Club is looking to obtain a water withdrawal permit for 500,000 GPD from Lake Hartwell to supplement its irrigation ponds during droughts while also keeping an eye on future water demands as the development continues to grow.

### Demand for Water

Currahee Club's highest demand for water occurs primarily in the months of May through September, Currahee Club's peak season. During these months and in a period of drought, for example the "quiet drought" of 2012, as much as 900,000 gallons of water were applied to the golf course, road side turf and the club house/amenity grounds in one night; however, this has not been done often and even during a severe to extreme drought should not occur on an every night basis.

To evaluate water use for the golf course and common areas during moderate to severe drought conditions, Currahee Club's Golf Course Superintendent and Landscape Manager set up scenarios of irrigation with their Toro-SitePro Irrigation Program. The period of evaluation was one week as their daily watering patterns differ. From this evaluation, based on current site development, it was discovered that during moderate to severe drought conditions an average of 300,000 GPD would be used during peak season. Graph 1 below displays the amount and pattern of water used for the golf course and landscaped common areas over the course of a week.

## Issue Resolution Conference



**Hartwell Lake and Dam Water Storage Reallocation Study  
Issue Resolution Conference  
Memorandum For Record  
13 May 2014**

**1. Overview**

This Memorandum For Record documents the collaborative conclusions reached on specific policy, legal, and technical issues at the 5 September 2012 Issue Resolution Conference held to identify an acceptable study approach and methodology.

**2. Vertical Team and Project Delivery Team Members**

**The following vertical team members participated in the IRC:**

WMRS PCX: Brad Hudgens

HQ RIT: Stacey Brown, Deputy Chief of Civil Works, RIT, and David Apple

HQUACE: Marilyn Benner, CECW-PC; Daniel Inkelas, CECC-C; Gary Hardesty; Jerry Webb, CECW-CE; and Marilyn Benner, CECW-PC; IWR: Bruce Carlson

CESAD: Terry Stratton, Planning

**The following Project Delivery Team members participated in the IRC:**

Lake Hartwell Project: George Bramlette, Sandy Campbell, and Jamie Sykes

Savannah District: Stan Simpson, Water Control; Larry Olliff, PD Environmental; Jason Ward, Water Control; Jeff Morris, PD Economics; Terry Peters and Michael Grave, OC

HAC: Russ Davidson

**3. Introduction to the Project**

Congress authorized Hartwell Lake and Dam in 1950. The Corps constructed the project between 1955 and 1963. The authorized purposes include flood control, hydropower, navigation, recreation, water quality, water supply, and fish and wildlife management.

Hartwell Lake and Dam was the second Corps reservoir project to be built in the Savannah River Basin. The first, J. Strom Thurmond Lake and Dam, was completed in 1952. A third reservoir project, Richard B. Russell Lake and Dam, was completed in 1985.

Hartwell Lake borders Georgia and South Carolina on the Savannah, Tugaloo, and Seneca Rivers. Hartwell Dam is located on the Savannah River seven miles below the point at which the Tugaloo and Seneca Rivers join to form the Savannah River. Extending 49 miles up the Tugaloo and 45 miles up the Seneca at normal pool elevation, Hartwell Lake comprises nearly 56,000 acres of water with a shoreline of 962 miles.

The Corps presently operates the three reservoirs as a system, whereby water management actions taken in one reservoir affect the other two. The three projects generate to meet a single system power goal. As pools decline, the projects balance with each other.

#### **4. Total Storage Space in Hartwell Lake**

Hartwell Lake has 293,000 acre-feet of flood control storage, 1,416,000 acre-feet of conservation storage, and 1,134,100 acre-feet of inactive storage.

#### **5. Existing Water Storage Space Agreements**

Hartwell Lake currently has three water supply storage agreements that total 26,574 acre-feet. Anderson Regional Joint Water System (ARJWS) has 24,620 acre-feet, estimated to yield 35.02 mgd. The City of Lavonia has 127 acre-feet, estimated to yield 0.18 mgd. Hart County has 1,827 acre-feet, estimated to yield 2.6 mgd.

#### **6. Recent Requests for Storage Space**

Four entities have requested water supply storage reallocations: Pioneer Rural Water District (5 mgd); ARJWS (15 mgd); City of Lavonia (4 mgd); and Landology (1 mgd). The combined requests total an estimated yield of 25 mgd. This is equivalent to approximately 21,250 acre-feet in storage space.

#### **7. Approval Authority**

When combined with the existing water supply storage agreements, the recently requested water supply storage reallocations would not exceed 15 percent of total usable storage and/or 50,000 acre-feet. ER 1105-2-100 dated 22 April 2000 states that 15 percent of total storage capacity allocated to all authorized project purposes or 50,000 acre feet, whichever is less, may be allocated from storage authorized for other purposes or may be added to the project to serve as storage for municipal and industrial water supply at the discretion of the Commander, USACE as long as the reallocations do not result in severe effects on other authorized purposes or require major structural or operational changes. If reallocations do have a severe effect on other authorized purposes or that would involve major structural or operational changes, Congressional approval is required for the reallocation.

CESAS expects the recently requested storage would not severely affect other authorized purposes or require major structural or operational changes. Therefore, Congressional approval would likely not be required for the recently requested allocations. The reallocation report will document all of these findings.

#### **8. Objective of IRC:**

The objective of the Issue Resolution Conference (IRC) was to discuss certain policy, legal, and technical issues with the Corps' vertical team and obtain direction on these issues to ensure the study approach is acceptable. Conducting the IRC before initiating the technical work ensures efficient and effective execution and delivery of the study products.

## 9. Outcomes of the IRC

The vertical team provided the following directions to the study team:

**(a) ISSUE: Is it acceptable to calculate storage space (acre-feet) required to meet firm yield (million gallons/day) by using an iterative approach?**

**DECISION:** The vertical team concurred with Savannah District's proposal to calculate the yield by using monthly inflows (cfs) to the reservoir system, monthly withdrawals (mgd) from the reservoir system, and tracking the water remaining in the contracted water supply storage. The HEC draft report, "Methods for Storage/Yield Analysis," (Dec. 2010) recommends an iterative simulation approach as the preferred method for calculating a reservoir's firm yield. The water storage requirement would be determined by estimating an initial storage space requirement necessary to meet a specified firm yield, and, then, tracking the storage space remaining from the initial estimate through the drought of record. Through iteration, the initial estimate would be adjusted until the requested storage requirement is totally depleted during the drought of record. The draft storage yield will be reviewed by HEC and the PCX.

**(b) ISSUE: Should expected returns be credited when determining storage requirements?**

**DECISION:** There was consensus among the vertical team to not give credit to those who return water because it is not Corps policy to do so. Return flows are not guaranteed, and it is storage that the Corps is providing, not a certain quantity of water. Return flows can be modeled in ResSim, but should not be credited to the user.

**(c) ISSUE: Is it acceptable to evaluate system impacts rather than evaluating each project individually?**

**DECISION:** Savannah District operates the three multi-purpose reservoir projects on the Savannah River as a combined system. Rather than evaluating each project individually, Savannah District intends to define potential water supply impacts to current reservoir operation with HEC ResSim using a reservoir system model approach. The District will evaluate the impacts of withdrawals on the three reservoir system implementing their inter-related operational rules using HEC ResSim. If we do not use a systems approach, how would the impacts of a withdrawal from an upstream project (Hartwell) be identified on the benefits or revenues foregone of a downstream project (Thurmond)?

The vertical team reached a consensus that a systems approach is the appropriate methodology for this reallocation analysis. The vertical team suggested that the storage price be related to the project from which it is being drawn. Mobile District has used this approach in response to litigation on the ACF system. Omaha District also used this system approach on a reallocation study for the Missouri River main stem system. Little Rock District has used a system analysis for reallocations in their six-lake White River system, for individual lakes, as well as the system-wide Whiter River Minimum Flows. The vertical team highly recommended that the District closely coordinate with the vertical team in the future on related considerations such as pricing storage.

**(d) ISSUE: Is it acceptable to combine all four requests and calculate an average storage value to calculate each requestor's cost?**

**DECISION:** The vertical team's consensus was to accept the District's proposal to combine all four water storage allocation requests into one for analysis purposes. The report would identify the highest value of the total storage required to meet the combined new storage requirement, using benefits foregone or replacement cost, revenues foregone, and the updated cost of storage. After the highest user cost is determined, it would be divided by the combined acre-feet requested to provide the average user cost per acre foot. The cost for a given requestor would be calculated by multiplying the average cost per acre foot by the amount of acre-feet requested by that user.

This approach has been used on previous studies. However, rather than calculate an average cost per acre-foot then multiply by each User's acre-feet, most reallocation reports with multiple Users present the total cost of storage for the lake's Total Useable Storage then multiplies that cost by the percentage that each User's reallocated storage represents of the lake's Total Useable Storage. This percent calculation is used in the Water Storage Agreement, so the report should show the same calculation. Plus, the percentage is needed to calculate the annual O&M payment. Identifying an average cost per acre foot is interesting, but is an added step. Also, if there is DYMS, each user usually is responsible for a different amount calculated by the order in which their agreements are signed—this might affect the average cost per acre foot amount. There should be example reports from Tulsa District and Little Rock District. (Note that ER 1105-2-100 defines a reservoir's Total Useable Storage to consist of its conservation and flood control pools, but not its inactive pool.)

**(e) ISSUE: Is it acceptable to consider Inactive Storage as a source of storage for water supply?**

**DECISION:** IWR Report 96-PS-4 Revised, Chapter 4, B.1.a. states "Inactive storage is typically reserved for hydropower head and/or to store sediment that is expected to accumulate over the life of the project. While the inactive pool can be used, it is generally not available to meet downstream water needs." The Hydroelectric Design Center determined in 2011 that the hydropower facilities at the three Savannah River projects can operate well below the bottom of the conservation pools. Preliminary analyses indicate that a significant amount of inactive storage still exists because there has been very little sedimentation over the life of the project. However, accurate quantification of the volume in the inactive pool and predictions of future sedimentation would require substantial expenditures. Savannah District believes that it should not consider inactive storage as a potential source for the requested water supply storage. The vertical team concurs with the District's opinion. However, they suggest that an explanation should be given in the report as to why the inactive pool should not be considered as a management measure.

consideration. Exclusions can only be granted by HQ. CESAD and the WMRS PCX will work with the PDT as needed to assist in preparing the exclusion request. The type of NEPA document required (EA vs. EIS) will be an important consideration as well. An EIS is not anticipated to be needed to address the impacts of reallocating storage to meet the four requests the District has received.

## Alternatives Milestone



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS, SOUTH ATLANTIC DIVISION  
60 FORSYTH STREET SW, ROOM 10M15  
ATLANTA GA 30303-8801

CESAD-PDP

MEMORANDUM FOR Commander, US Army Corps of Engineers (CECW-SAD/Stacey Brown), 441 G Street, NW, Washington DC 20314-1000

SUBJECT: Hartwell Water Supply Reallocation Study: Alternatives Milestone Meeting

1. Reference Memorandum, CESAS-PD, October 13, 2016, subject as above.
2. The Hartwell Water Supply Reallocation Study Alternatives Milestone Meeting (AMM) was held on 16 September 2016 via teleconference and webinar. A list of participants is included in Reference 1.
3. This memorandum documents the Vertical Team confirmation of the Alternatives Milestone for the Hartwell Water Supply Reallocation Study, and key outcomes and decisions associated with the milestone.
4. The following major decisions were made during the AMM. All decisions are being incorporated into the project decision log.
  - a. Concurrence that the Alternatives Milestone has been achieved.
  - b. The Vertical Team questioned the alternative of reallocating from the flood control pool had been screened out too early. Subsequently the Vertical Team instructed the District to perform an additional analysis of using the flood control pool before eliminating that alternative. The District reviewed the request and reassessed this alternative. The result of their reassessment is covered in their 27 September 2016 MFR attached to Reference 1. The District requested an in progress review (IPR) with the vertical team to discuss the results. CESAD will schedule the IPR.
  - c. HQUSACE requested CESAS prepare an IEPR waiver request.
  - d. CESAS was instructed to communicate with external users and customers, the public, and natural resources agencies about the study as soon as possible.
  - e. Pending resolution and concurrence by the Vertical Team regarding the evaluation of the flood control pool alternative, the Project Delivery Team should prepare for identifying a Tentatively Selected Plan.
5. The point of contact for this action is Mr. Daniel Small at (404) 562-5224.

ERIC L. BUSH  
Chief, Planning and Policy Division



DEPARTMENT OF THE ARMY  
SAVANNAH DISTRICT, CORPS OF ENGINEERS  
100 W. OGLETHORPE AVENUE  
SAVANNAH, GEORGIA 31401-3840

REPLY TO  
ATTENTION OF:

OCT 13 2016

CESAS-PD

MEMORANDUM FOR Commander, South Atlantic Division, (ATTN: Eric Bush, CESAD-PDP) 60 Forsyth Street, RM 10M15, Atlanta, Georgia 30303

SUBJECT: Hartwell Water Supply Reallocation Study: Alternatives Milestone Meeting

1. The Hartwell Water Supply Reallocation Study Alternatives Milestone Meeting was held on 16 September 2016. Those in attendance represented the Savannah District (CESAS), Hydropower Analysis Center (HAC), South Atlantic Division (CESAD), CESAD Regional Integration Team (RIT), Office of Water Project Review (OWPR), HQUSACE, and the Water Management and Reallocation Studies Planning Center of Expertise (WMRS PCX).
2. In response to a question regarding the start date of the study: a formal work allowance was provided to the Savannah District to start the study on 8 April 2014. The PCX stated that Water Supply Reallocation (WSR) studies need to follow the SMART planning principles, but do not need to follow the 3x3x3 criteria.
3. The vertical team questioned whether the alternative of reallocating from the flood control pool had been screened out too early. HQUSACE reviewed the issue and, after the AMM, instructed the District to perform an additional analysis of using the flood control pool before eliminating that alternative. CESAS is to conduct a screening-level economic analysis to estimate the economic damages that would result from reallocating storage from the flood control pool. When this analysis is complete, CESAS will schedule a follow-up IPR with the vertical team to discuss the results. If the additional economic analysis indicates that reallocation from the flood control pool would be the NED plan, then that should be the TSP. If the difference between flood damages and hydropower losses are close, additional analysis may be warranted. At that IPR, the District should confirm that the TSP would not have serious impacts to authorized project purposes. If serious impacts to those purposes are expected, the Reallocation Report would need to go to Congress for authorization. Paragraph 7 provides additional information on this topic.



CESAS-PD

SUBJECT: Hartwell Water Supply Reallocation Study: Alternatives Milestone Meeting

4. To reflect the inter-related operations of the three multi-purpose reservoir projects on the Savannah River, CESAS evaluated the impacts from potential storage reallocations using the HEC ResSim model, which uses a reservoir systems approach. To enable USACE to respond more efficiently to the requests for water reallocations from the Hartwell Project, CESAS has been evaluating the impacts of reallocating the 315.67 MGD of storage remaining for reallocation from the 3-reservoir system within the Chief of Engineers' discretionary authority. That approach was identified in the approved Project Management Plan. At the AMM, HQUSACE stated that the study should instead respond to -- and its recommendation be formulated based on -- the water withdrawal requests for 24.55 MGD that the project has received to date. This guidance does not preclude analyzing impacts of withdrawals from Hartwell on the entire 3-reservoir system.

5. HQUSACE requested CESAS prepare an IEPR waiver request.

6. CESAS is to communicate with external users and customers, the public, and natural resource agencies about the study as soon as possible.

7. I am enclosing for your review an MFR of a working meeting held on 26 September 2016 about the additional screening-level economic analysis for using the flood control pool. The results indicate that the economic losses of reallocating storage from the flood control pool would be greater than from the conservation pool. This confirms the PDT's approach in its detailed evaluation of alternatives for meeting the identified water supply needs. If this does not fully address HQUSACE's question on this issue, the District is ready to participate in a teleconference with the vertical team to discuss the issue further. At this point, the PDT has not identified any serious impacts to the authorized project purposes from reallocating from the conservation pool.

*William G. Bailey*

Encl

WILLIAM G. BAILEY, P.E.  
Chief, Planning Division

## MEMORANDUM FOR RECORD

SUBJECT: Hartwell Water Supply Reallocation Study: Conceptual Screening-Level Analysis of Economic Losses due to Reallocating Storage from the Flood Control Pool

1. A working meeting was held on 26 September 2016 to discuss the economic effects of reallocating storage from the flood control pool. The following organizations were represented at the 26 September meeting: Savannah District (CESAS), the Hydropower Analysis Center (HAC), and the South Atlantic Division (CESAD).
2. At the Alternatives Milestone Meeting (AMM) held on 16 September 2016, the vertical team questioned whether the alternative of reallocating from the flood control pool had been screened out too early. HQUSACE reviewed the issue and, after the AMM, instructed the District to perform an additional screening-level economic analysis of using the flood control pool before eliminating that alternative.
3. During the 26 September meeting, the PDT along with CESAD conducted a screening-level economic analysis by analyzing the economic losses expected to result from reallocating storage from the flood control pool.
  - (A) The hydropower benefit modeler stated that the hydropower benefits foregone, if storage in the flood control pool is reallocated, would be equal to the hydropower benefits foregone, if storage in the conservation pool is reallocated to water supply. The effects on hydropower would be the same no matter which of those two pools is used.
  - (B) However, use of the flood control pool would result in additional economic losses. Additional flood damages would be induced downstream. Those damages would be measurable, but are likely to be minor for the volumes presently being considered.
  - (C) Reallocating from the flood control pool would also result in a third economic effect – the cost of Dependable Yield Mitigation Storage (DYMS). When storage is reallocated from the flood control pool by raising the top of the conservation pool, the yield/storage ratio of the conservation pool would decrease and the amount of storage allocated to each existing water supply user must be increased to maintain their expected yield. To keep the existing water supply users whole, the costs of the additional storage required to meet the DYMS would need to be included.

The sum of these three economic losses (when reallocating storage from the flood control pool) would be greater than the economic losses that would result from reallocating from the conservation pool.

4. The additional screening-level economic analysis indicates that reallocation from the flood control pool would be more expensive than reallocating from the conservation pool, since additional costs would be incurred with use of the flood control pool.
5. The next step is to schedule an IPR with the vertical team to discuss these results.

Jeff Morris  
Team Leader, Plan Formulation Section

Exclusion from Type I IEPR and Review Plan Approval



DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS  
SAVANNAH DISTRICT  
100 W. OGLETHORPE AVENUE  
SAVANNAH, GEORGIA 31401-3604

CESAS-DE

12 SEP 2018

MEMORANDUM FOR Commander, South Atlantic Division, (ATTN: Eric Bush, CESAD-PDP) 60 Forsyth Street, RM 10M15, Atlanta, Georgia 30303

SUBJECT: Request for MSC Commander Approval of Review Plan (RP) and Independent External Peer Review (IEPR) Exclusion for Lake Hartwell Water Supply Storage Reallocation Integrated Feasibility Report

1. References:

a. EC 1165-2-217, Review Policy for Civil Works, 20 February 2018.

b. Draft Review Plan for Lake Hartwell Water Supply Storage Reallocation Integrated Feasibility Report.

2. Savannah District requests that the Lake Hartwell Water Supply Storage Reallocation Integrated Feasibility Report RP and IEPR exclusion be approved. In accordance with EC 1165-2-217 and based on a careful review of project risks, the Savannah District, USACE has determined that the study may be excluded from IEPR, and would not significantly benefit from IEPR, because of the following reasons.

a. At this time, the subject study does not meet the requirements for a mandatory Type I IEPR. The project does not represent a significant threat to human life; has a cost estimate that is less than \$200 million; is not controversial; and there has been no request for an IEPR by a governor or the head of a Federal or state agency.

b. The subject project meets the requirements for potential exclusion from IEPR. The project does not require an Environmental Impact Statement (EIS); is not controversial; has no adverse impacts on scarce or unique tribal, cultural, or historic resources; has no adverse impacts on any fish or wildlife species or their habitat whether or not they are listed as endangered or threatened under the Endangered Species Act of 1973; and will not contain influential scientific information or highly influential scientific assessments.

c. There is ample experience within the district to conduct this study. The proposed reallocations will amount to less than five percent of the conservation pool at the project. There will be no pool raising nor will there be any construction activities on site. The study will not be based on novel methods; does not present complex challenges for interpretation, does not contain precedent-setting methods or

CESAS-DE

SUBJECT: Request for MSC Commander Approval of Review Plan (RP) and Independent External Peer Review (IEPR) Exclusion for Lake Hartwell Water Supply Storage Reallocation Integrated Feasibility Report

models, and will not present conclusions that are likely to change prevailing practices.

3. Should any of these conditions change throughout the execution of this study the Savannah District will immediately notify you and re-evaluate this request.
4. SAS requests that SAD support and endorse this Request for Exclusion from the requirement for a Type I IEPR of the subject study, and approve the draft RP.
5. The point of contact for this action is Mr. Jeff Morris, Team Leader, Plan Formulation Section of the Planning Branch.

- 4 Encls
1. WMRS-PCX Memo
2. WMRS-Checklist
3. Review Plan
4. UEPR Exclusion

  
DANIEL H. HIBNER, PMP  
COL, EN  
Commanding



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, SOUTHWESTERN DIVISION  
1100 COMMERCE STREET  
DALLAS, TX 75242-1317

CESWD-PDP

21 August 2018

MEMORANDUM FOR Commander, South Atlantic Division, 60 Forsyth Ave, Atlanta, GA, 30303.

SUBJECT: Recommended Approval of the Review Plan for the Hartwell Water Supply Storage  
Reallocation Integrated Reallocation Report and Environmental Assessment

1. The Water Management and Reallocation Studies Planning Center of Expertise (PCX) has reviewed the draft Review Plan (RP) for the subject study, provided 21 August 2018, and recommends it for your approval. The PCX concurs that the RP satisfies the policy requirements for peer review outlined in Engineering Circular (EC) 1165-2-217, Civil Works Review Policy, dated 20 February 2018. The enclosed review checklist is provided for your information.
2. As a The RP includes a risk-informed decision to request an exclusion from Type I Independent External Peer Review (IEPR) for this study. The PCX concurs with this decision. Final approval for an exclusion from Type I IEPR must be obtained. Should either the MSC Commander or the DCW disapprove the request to exclude the study from IEPR, the RP should be revised to include IEPR. If the District publishes the RP prior to obtaining approval for this exclusion, we recommend that the RP state that the exclusion is pending final approval.
3. The District should post the approved RP and the MSC Commander's approval memorandum to its web site, and provide links to the PCX and Headquarters for posting on their web pages. In addition, electronic copies of both documents should be provided to the PCX for our files.
4. If substantive revisions are made to the RP, due to changes in project scope or Corps policy, the revised RP should be provided again to this PCX for review. Non-substantive changes or updates do not require further PCX review.
5. As work on this study progresses, the District should ensure that the execution of peer reviews and quality assurance of planning models, as indicated in the RP, are managed through the PCX.
6. If you have any questions or concerns regarding this review, please contact Ms. Cherilyn Plaxco, CESWD-PDP, at 501-324-5036.

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CHERILYN PLAXCO  
Technical Director, WMRS PCX

CF: (w/encls)  
CESAS-PD (Dodd)  
CESAD-PDP (Bush, O'Donnell)



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
U.S. ARMY CORPS OF ENGINEERS, SOUTH ATLANTIC DIVISION  
60 FORSYTH STREET SW, ROOM 10M15  
ATLANTA, GA 30303-8801

CESAD-PDP

24 January 2019

MEMORANDUM FOR Commander, Savannah District

Subject: Approval of Review Plan and IEPR Exclusion for the Lake Hartwell Water Supply Storage Reallocation Integrated Feasibility Report

1. References:

a. CESAS-DE, subject: Request for MSC Commander Approval of Review Plan (RP) and Independent External Peer Review (IEPR) Exclusion for Lake Hartwell Water Supply Storage Reallocation Integrated Feasibility Report, 12 September 2018.

b. CECW-P, subject: Revised Delegation of Authority in Section 2034(a)(5)(A) of the Water Resources Development Act of 2007 (WRDA 2007), as amended (33 U.S.C. 2343), 07 June 2018.

2. The attached Review Plan for the Lake Hartwell Water Supply Storage Reallocation Integrated Feasibility Report has been prepared consistent with EC 1165-2-217. The Review Plan has been coordinated with the Water Management and Reallocation Studies Planning Center of Expertise, which is the lead office to execute this plan. For further information, contact the WMRS-PCX at (501)324-5036. The Review Plan does not include independent external peer review.

3. I hereby approve this Review Plan and the request for exclusion from independent external peer review, which is subject to change as circumstances require, consistent with study development under the Project Management Business Process. Subsequent revisions to this Review Plan or its execution due to significant changes in the study, study scope or level of review will require new written approval from this office.

4. The point of contact for this action is Patrick O'Donnell, 404-562-5226.

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DIANA M. HOLLAND  
Brigadier General, USA  
Commanding



Corps Dam Safety Officer Review of the Dam Safety Action Classification  
for Clemson Lower Diversion Dam Dike



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS  
441 G STREET, NW  
WASHINGTON, DC 20314-1000

CECW-EC

MAY 14 2018

MEMORANDUM FOR COMMANDER, SAD DIVISION (CESAD-DE)

SUBJECT: Corps Dam Safety Officer Review of the Dam Safety Action Classification for Clemson Lower Diversion Dam Dike (SC02754AS1)

1. The out-of-cycle Periodic Assessment (PA) for Clemson Lower Diversion Dam Dike (CLDD Dike) was presented to the Dam Safety Senior Oversight Group (DSOG) on 16 November 2017 in Atlanta, Georgia. In general accordance with ER 1110-2-1156, the Savannah District completed the PA for the saddle dike due to a previously unknown issue discovered in 2015.

2. A limited potential failure mode analysis (PFMA) and semi-quantitative risk assessment (SQRA) were performed to address this issue; a full PA was not conducted. The PA team concluded that the risks due to breach of the CLDD Dike were moderate.

a. The incremental risks are primarily driven by the potential for backward erosion piping of the foundation of the CLDD Dike. Seismic potential failure modes were judged to be non-risk drivers.

b. The primary consequence center is Clemson, South Carolina. Estimated population at risk (PAR) due to dam breach ranges from 100 (day) to 50 (night) for top of active storage; there is no non-breach PAR because there are no planned operational releases associated with this project. Estimated incremental life loss for the risk-driver potential failure modes ranged from 10 to 100 (day) given the heavy population within the area during the day, and 1 (night).

3. The following safety recommendations were approved by the DSOG:

Dam Safety Action Items

- 2017-SC02754AS1-DS-001: Complete an Issue Evaluation Study (IES) to further evaluate and quantify the existing risk condition (PFM C-21).

O&M Action Items

- 2017-SC02754AS1-OM-001: Produce an Interim Risk Reduction Measures Plan (IRRMP) based on the results of this risk assessment (DSPMT 2). The dam was previously classified as a DSAC 4 and did not require an IRRMP. Based on the results of this risk assessment, the dam is recommended to be reclassified to a

CECW-EC

SUBJECT: Corps Dam Safety Officer Review of the Dam Safety Action Classification for  
Clemson Lower Diversion Dam Dike (SC02754AS1)

DSAC 3. An IRRMP is recommended to be developed and implemented to reduce risk while long-term remediation is investigated.

- 2015-SC02754AS1-OM-002: Perform exploratory borings, install piezometers, develop well detailed geologic cross-section through the saddle dike, and evaluate the saddle dike foundation seepage (DSPMT Code 4).

4. Based on a detailed review of all project data, the incremental risks have increased, and the project is reclassified from Dam Safety Action Classification (DSAC) 4 to DSAC 3. The PA team recommended retaining a DSAC 4 since they felt the incremental risks at the project had not changed. The DSOG recommended a DSAC 3 based on their conclusion that the risks were higher than portrayed by the PA team.

a. This decision memorandum must be attached to the front of the PA report, which contains the supporting information, and the complete report must then be uploaded to ProjectWise.

b. The district must update the Dam Safety Program Management Tools (DSPMT) to reflect the new DSAC assignment and associated condition code. Also, the CLDD Dike should be added to the National Inventory of Dams (NID) with the NID identifier SC02754AS1.

c. An Interim Risk Reduction Measures Plan (IRRMP) must be developed and implemented.

5. The point of contact is Jacob Davis, P.E., HQUSACE Dam Safety Program Manager, at (202) 761-4643 or Jacob.R.Davis@usace.army.mil.



ERIC C. HALPIN, P.E.  
Deputy Dam Safety Officer  
US Army Corps of Engineers

CF:  
CECW-CE (Halpin, Davis)  
CEIWR-RMC (Shortland, Grove, Allen, Williams, Bradley)  
CESAD-RB-T (Smith, Hernandez)  
CESAS-DE  
CESAS-EN (Hendren)

CECW-EC

SUBJECT: Corps Dam Safety Officer Review of the Dam Safety Action Classification for  
Clemson Lower Diversion Dam Dike (SC02754AS1)

CESAS-EN-H (Newberry)

CELRH-DSPC-TS (Whitmore)

CEAGC-GSA (Ragon)

## In-Progress Review

South Atlantic Division Concurs to Screen Out the FRM Pool as an  
Alternative



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS, SOUTH ATLANTIC DIVISION  
60 FORSYTH STREET SW, ROOM 10M15  
ATLANTA, GA 30303-8801

CESAD-PDP

10 JUL 2018

MEMORANDUM FOR Commander, Savannah District (CESAS-DE), ATTN: CESAS-PPPM (Erik T. Blechinger)

SUBJECT: Lake Hartwell Water Supply Storage Reallocation Study, Vertical Team In-Progress Review Teleconference and Webinar, 9 April 2018, Reformulation of Water Supply Storage Reallocation Alternatives

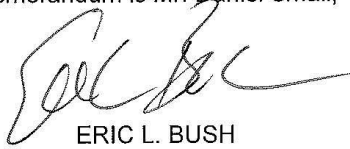
1. Reference memorandum, CESAS--PPPM, 18 May 2018, subject as above.
2. The attached In Progress Review (IPR) Memorandum from the Lake Hartwell Water Supply Reallocation (WSR) Study Vertical Team (VT) meeting held 9 April 2018, summarizes the VT's directions forward and the District's planned actions for the Lake Hartwell WSR and the Savannah River Basin Comprehensive Drought Contingency Plan (SRBC-DCP) Study. As stated in the memorandum, SAS with input from the Vertical Team, plans to:
  - a. Request an exemption to obtain approval from the USACE Dam Safety Officer to continue the Lake Hartwell WSR study;
  - b. Screen out the Flood Risk Management (FRM) pool as an alternative based on the length of time it would take to re-establish Clemson Lower Diversion Dam Dike as a Dam Safety Action Classification (DSAC) 4;
  - c. Use recent sediment studies prepared for Lake Thurmond and Richard B. Russell Dams (RBR) to estimate sediment accumulation in Lake Hartwell; and
  - d. Prepare critical yield analysis using the SRBC-DCP.
3. In support of these actions, SAD has been asked to provide:
  - a. Close coordination in processing the exemption for USACE DSO approval;
  - b. Concurrence to screen out the FRM pool as an alternative;
  - c. Concurrence to use Lake Thurmond and Richard B. Russell sediment study as a basis for Lake Thurmond's sedimentation analysis;
  - d. Concurrence to use the SRBC DCP to prepare critical yield. Note: the SRBC DCP is scheduled to be submitted to SAD for review in August 2018. The final SRBC DCP

CESAD-PDP

SUBJECT: Lake Hartwell Water Supply Storage Reallocation Study, Vertical Team In-Progress Review Teleconference and Webinar, 9 April 2018, Reformulation of Water Supply Storage Reallocation Alternatives

report is scheduled to be submitted to SAD for approval before the need of the 4th Quarter, 31 September 2018."

4. We concur with the above requests and will provide close coordination as the District moves through the action plan.
5. During our review of the IPR recommendations and action plan, we saw limited reference to input from the Hydropower Community of Practice. We request that as the two studies are integrated, potential impacts of proposed actions on hydropower be addressed throughout the various phases of the two studies.
6. The point of contact for this memorandum is Mr. Daniel Small, 404-562-5224.



ERIC L. BUSH  
Chief, Planning and Policy

Encl  
as

## Interim Risk Reduction Measures Plan





REPLY TO  
ATTENTION OF:

DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS, SOUTH ATLANTIC DIVISION  
60 FORSYTH STREET, SW, ROOM 10M15  
ATLANTA, GEORGIA 30303-8801

CESAD-RBT

30 November 2018

MEMORANDUM FOR DAM SAFETY OFFICER, SAVANNAH DISTRICT (CESAS-EN/TRACY L. HENDREN, P.E.)

SUBJECT: Approval of Clemson Lower Diversion Dam Saddle Dike Interim Risk Reduction Measures Plan (IRRMP), 26 November 2018

1. References:

a. Engineering Regulation (ER) 1110-2-1156, Safety of Dams – Policy and Procedures, 31 March 2014.

b. Email from Lucia A. Newberry, P.E., CESAS-EN-H, Dam Safety Program Manager, 26 November 2018, requesting Interim Risk Reduction Measures Plan (IRRMP) approval.

2. The IRRMP submitted by the Savannah District through reference 1.b is hereby approved in accordance with Chapter 7 of reference 1.a.

3. District Quality Control (DQC) review, Agency Technical review (ATR), and HQ/Risk Management Center (RMC) review have been completed and comments were adequately addressed and incorporated in the final IRRMP submittal.

4. The District is directed to upload the approved IRRMP to the Corps of Engineers Dam and Levee Safety (CEDALS) website. This IRRMP must be reviewed annually and after each periodic inspection or assessment, and revised as required.

5. The SAD point of contact is José Hernández, P.E., CESAD-RBT, 404-562-5112.

  
CHRISTOPHER T. SMITH, P.E.  
Dam Safety Officer

Dam Safety Considerations for Water Supply Storage Allocation and  
Reallocation Studies – Letter from District Commander to Requestors and  
Requestors' Replies



DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS  
SAVANNAH DISTRICT  
100 W. OGLETHORPE AVENUE  
SAVANNAH, GEORGIA 31401-3604

07 JAN 2019

Executive Office

Mr. Andrew D. Ward  
President and Managing Partner  
Currahee Club on Lake Hartwell  
One Currahee Club Way  
Toccoa, Georgia 30577

Dear Mr. Ward:

You have requested storage space in Hartwell Lake for water supply uses. Such storage may be available, subject to preparation and approval of a report and compliance with applicable Federal and state laws and regulations. Before proceeding further with the current study we must inform you of the status of the Clemson Lower Diversion Dam Saddle Dike. This dam is part of the Hartwell Dam and Lake Project and a recent issue may impact water supply storage.

The U.S. Army Corps of Engineers (USACE) has a responsibility to provide water supply storage in a safe, secure and reliable environment. As such, we continually evaluate our dams and determine if remediation may be necessary to meet and maintain current USACE safety standards.

USACE is committed to the safety of its dams. USACE dams are classified through a risk assessment process into five Dam Safety Action Classes (DSAC) which represent varying levels of urgency of action and incremental flood risk.

The Clemson Lower Diversion Dam Saddle Dike was constructed in order to prevent Hartwell Lake from flooding a portion of Clemson University. Thus, the Saddle Dike is part of the Hartwell Dam and Lake Project. The Saddle Dike has recently been classified DSAC 3, which is a lower classification than previously determined. As a result, USACE plans to implement interim or long-range measures to remediate the condition which led to the dam's new DSAC assignment. These measures may impact the storage in the reservoir for water supply purposes, such that the amount of storage available for water supply could be reduced. Currently, USACE is monitoring the situation, but if remediation is required, USACE water supply storage agreements require non-Federal users to share the costs of remediation in proportion to the storage space that has been provided to each user.

In the interests of public safety, USACE water supply policy does not allow the top of the conservation pool (guide curve) to be raised at projects where dams are classified

DSAC 1, 2 or 3. Therefore, only storage below the top of the conservation pool may be considered for water supply purposes.

We will continue to work with you in your efforts to meet your present and future water needs. To this end, we continually review our projects for effectiveness, efficiency and safety. If you have questions, please contact Mr. Jeff Morris at (912) 652-5008 or [jeffrey.s.morris@usace.army.mil](mailto:jeffrey.s.morris@usace.army.mil). We ask that you please acknowledge in writing the receipt of this letter and your desire to continue as a requestor.

Sincerely,



Daniel H. Hibner, PMP  
Colonel, U.S. Army  
Commanding



# CITY OF LAVONIA

"A GEORGIA CITY OF EXCELLENCE"

---

**COPY**

January 18, 2019

U.S. Army Corps of Engineers  
100 W. Oglethorpe Avenue  
Savannah, GA 31401

To whom it may concern,

The City of Lavonia acknowledges the letter dated January 7, 2019 from Col. Daniel H. Hibner. We wish to continue the process for obtaining an increase in water supply storage from Lake Hartwell.

We understand that the flood risk management pool cannot be used as a water supply storage reallocation option; and that potential future remediation costs to maintain USACE safety standards related to the Clemson Lower Diversion Dam Saddle Dike require the City of Lavonia to share those costs in proportion to the storage space that would be provided.

The City of Lavonia understands the costs typically associated with water supply storage reallocations including potential costs of modifications for Dam Safety related reasons.

Please let me know when and if additional steps should be taken by the City to secure the increased allocation.

Sincerely,

Charles L. Cawthon  
City Manager



998 Hunters Trail Anderson, SC 29625  
Phone: 864-332-6534 Fax: 864-224-6116

January 29, 2019

U.S. Army Corps of Engineers, Savannah District  
Attention: Mr. Daniel H. Hibner, PMP, Colonel  
100 W. Oglethorpe Avenue  
Savannah, GA 31401-3604

Re: Storage Space in Hartwell Lake for water supply  
Anderson Regional Joint Water System (ARJWS)

Dear Mr. Hibner,

This letter serves as ARJWS' acknowledgement of the recent letter received from the ACOE regarding the dam reclassification in Clemson as it relates to the reallocation study moving forward (see attached). ARJWS desires to continue as a requestor for additional storage space in Hartwell Lake for water supply uses. Should you need anything additional, please contact me at (864) 332-6532 or [jbarrington@arjwater.com](mailto:jbarrington@arjwater.com).

Sincerely,

A handwritten signature in blue ink, appearing to read 'Jennifer H. Barrington'.

Jennifer H. Barrington, P.E.  
System Engineer

Cc: Mr. Jeff Morris, ACOE Savannah GA  
Ms. Sandy Campbell, ACOE Hartwell GA  
Mr. Jamie Sykes, ACOE Hartwell GA



## PIONEER RURAL WATER DISTRICT

5500 West-Oak Highway  
P. O. Box 203  
Westminster, SC 29693-0203

Phone: (864) 972-3082

### Board of Directors

Barry Stevenson, Chairman  
Jerry A. Barlow  
Eddie Grant  
Mark Holbrooks  
Ronnie Williams

January 22, 2019

Colonel Daniel H. Hibner, PMP  
District Commander  
US Army Corps of Engineers, Savannah District  
100 W Oglethorpe Ave  
Savannah, GA 31401-3604

Re: **Storage Space in Hartwell Lake for Water Supply Use**  
**Lake Hartwell Water Treatment Plant**  
**Pioneer Rural Water District**  
**Project No. 0743**

Dear Colonel Hibner:

Pioneer Rural Water District acknowledges receipt of your letter dated January 7, 2019 in reference to our requested storage space in Hartwell Lake for water supply use. Pioneer Rural Water District wishes to continue their request made in a letter dated February 16, 2010 to Mr. Virgil Hobbs, acting Operations Manager for the US Army Corps of Engineers – Hartwell Lake at the time of the request, that the U. S. Army Corps of Engineers reallocate storage in Hartwell Lake equivalent to a withdrawal capacity of 5 million gallons per day (MGD) for water supply purposes.

If you should have any questions or desire additional information, please do not hesitate to contact us.

With kind regards, I am

Sincerely yours,



Terry L. Pruitt  
General Manager

c: Mr. Donald Phillips, P. E.





July 23, 2021

U.S. Army Corps of Engineers  
100 W. Oglethorpe Ave.  
Savannah, GA 31401

To whom it may concern,

Currahee Club acknowledges the letter dated January 7, 2019 from Col. Daniel H. Hibner regarding the dam reclassification in Clemson. Currahee Club would like to continue as a requestor for storage space in Hartwell Lake. Please let me know if any additional information is needed.

Blessings,

Kristin Cooper  
Development Manager



Request for Exception to Continue the Water Supply Reallocation  
Study at Hartwell Lake



DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS  
SAVANNAH DISTRICT  
100 W. OGLETHORPE AVENUE  
SAVANNAH, GEORGIA 31401-3604

CESAS-EN

29 January 2019

MEMORANDUM THRU Dam Safety Officer, South Atlantic Division (Mr. Christopher Smith) *CS*

FOR Dam Safety Officer, Headquarters U.S. Army Corps of Engineers (Dr. Larry McCallister)

SUBJECT: Request for HQUSACE Approval to Continue the Water Supply Reallocation Study at Lake Hartwell

1. Reference(s):

- a. ER 1110-2-1156, Safety of Dams – Policy and Procedures, dated 31 March 2014

2. The purpose of this memorandum is to request HQUSACE approval for an exception to continue the Lake Hartwell water supply reallocation study. Per ER 1110-2-1156, Paragraph 24.7.1, reallocation studies are not allowed at projects where a Dam Safety Action Classification (DSAC) of 1, 2, or 3 is assigned to the dam, levee, dike, or appurtenant structure, except when approved by the HQUSACE Dam Safety Officer.

3. The Hartwell Dam and Lake Project is a multipurpose reservoir authorized by the Flood Control Act of 1950 and 1958, and the Water Resources Development Act of 1976, for the purposes of flood risk management, hydropower, fish and wildlife conservation, recreation, and water supply. The Hartwell Dam is located on the Savannah River approximately 6 miles east of Hartwell, Georgia. The Savannah River serves as the border between Georgia and South Carolina. Approximately 20 communities utilize Lake Hartwell for water supply.

4. As part of the Hartwell reservoir project, two Diversion Dams were constructed around Clemson University. The Dams, titled the Clemson Upper and Lower Diversion Dams, serve the purpose of preventing Lake Hartwell from flooding a large portion of Clemson University.

5. In 2012 the Hartwell Dam, Clemson Upper Diversion Dam, and Clemson Lower Diversion Dam was assigned a DSAC of 4, low urgency. An update to the risk assessment was performed in 2017 to include the recent observance of underseepage and piping occurring downstream of the Clemson Lower Diversion Dam Saddle Dike. The outcome of the updated risk assessment was the reclassification of the Saddle Dike to a DSAC 3, moderate urgency, on 14 May 2018.

6. As a result of the DSAC 3, an Interim Risk Reduction Measures Plan (IRRMP) was developed to include measures to reduce the probability of failure and/or incremental consequences associated with a failure due to underseepage and piping of the Saddle Dike. IRRMs include: updating the Emergency Action Plan to reflect new IRRMs, develop risk communication strategies for stakeholders (primarily Clemson University), monthly site inspections of the area downstream of the Saddle Dike, completion of a seepage investigation, setting piezometer threshold values, conduct emergency exercises specific to this issue, and

CESAS-EN

SUBJECT: Request for Exception to Continue the Water Supply Reallocation Study at Lake Hartwell

conduct issue-specific dam safety training with project personnel. Reservoir restrictions will not be implemented at this time.

7. In 2013, four entities requested the reallocation of water storage in Lake Hartwell to water supply. These requestors are: Pioneer Rural Water District, Anderson Regional Joint Water System, City of Lavonia, and Currahee Club. A water supply reallocation study was begun to evaluate the feasibility of the reallocation request. The combined requests total an estimated yield of 25 million gallons per day (MGD). For water storage to be reallocated to water supply, it must be taken from another existing use. Due to the recent reclassification of the Clemson Saddle Dike to DSAC 3, the flood risk management storage cannot be reallocated to water supply. Storage could only be reallocated from the conservation or inactive storage; hence, these are the alternatives that would be evaluated.

8. Reallocation from the conservation or inactive storage for water supply is believed to be low risk. The Clemson Lower Diversion Dam Saddle Dike DSAC rating is primarily a factor of the uncertainty of the foundation conditions of the Dike and the potential for internal erosion leading to failure. However, it was determined that pool restrictions are not a necessary IRRM. Thus, as long as there is no increase in the conservation pool elevation (660 ft-MSL), there is no increased risk incurred on the Saddle Dike.

9. The change in the Saddle Dike DSAC has been communicated to the requestors via writing, per Paragraph 24.7.6 of ER 1110-2-1156. The requestors understand that dam safety risks are dynamic and that future performance could require elevated monitoring and evaluation. Additionally, the requestors understand that upon execution of a water supply agreement, they will be required to share the costs of IRRM and any other remediation consistent with current policy. All requestors have submitted letters of intent stating they understand the cost, accept this risk, and wish to continue with the study.

10. Therefore, I request approval to allow the Lake Hartwell water supply reallocation study to continue regarding the consideration of reallocating water from the conservation pool or inactive pool for water supply. Please contact me if you have any questions at (912) 652-5927.



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TRACY HENDREN, P.E.  
Dam Safety Officer  
Savannah District



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
**US ARMY ENGINEER DIVISION, SOUTHWESTERN**  
**1100 COMMERCE STREET, SUITE 831**  
**DALLAS TX 75242-1317**

CESWD-PDP

26 February 2019

MEMORANDUM FOR Dam Safety Officer, Headquarters U.S. Army Corps of Engineers, 441 G Street NW, Washington, DC 20314-1000

SUBJECT: Coordination of Exception to Study Pool Reallocation Alternatives for Water Supply Storage at Hartwell Lake

1. References.
  - a. Engineering Regulation (ER) 1110-2-1156, Safety of Dams – Policies and Procedures; Chapter 24, "Dam Safety Considerations for Water Supply Storage Allocation and Reallocation and Related Studies," 31 March 2014.
  - b. CESAS Memorandum, "Request for USACE Approval to Continue the Water Supply Reallocation Study at Lake Hartwell", 29 January 2019.
2. The Savannah District coordinated the Exception Package with the WMRS PCX. The PCX has no comment on the package.
3. Point of Contact (POC). Any questions regarding this request can be directed to Ms. Cherilyn Plaxco, at 501-324-5036.

CHERYLYN G. PLAXCO  
Technical Director, WMRS PCX

CF:  
CESAD-RBT (Smith)  
CESAD-PD (Bush, O'Donnell, Small)  
CESAS-EC-D (Hendren)  
CESASP-PM (Morris)



DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS  
441 G STREET, NW  
WASHINGTON, DC 20314-1000

20 March 2019

CECW-EC

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, South Atlantic Division, ATTN: CESAD-DE, 60 Forsyth Street, SW, Atlanta, GA 30303

SUBJECT: Request for HQUSACE Approval to Continue the Water Supply Reallocation Study at Lake Hartwell

1. References:

a. Memorandum, CESAS-EN, dated 29 January 2019, through Dam Safety Officer, South Atlantic Division (CESAD-RBT), Subject: Request for HQUSACE Approval to Continue the Water Supply Reallocation Study at Lake Hartwell (Enclosure 1).

b. Memorandum, CESWD-PDP, dated 26 February 2019, Subject: Coordination of Exception to Study Pool Reallocation Alternatives for Water Supply Storage at Hartwell Lake (Enclosure 2).

c. ER 1110-2-1156, Safety of Dams – Policy and Procedures, dated 31 March 2014.

2. The request for an exception to ER 1110-2-1156, Safety of Dams - Policy and Procedures, Chapter 24, to study reallocation alternatives at a Dam Safety Action Classification (DSAC) 1, 2, or 3 dam, is approved for Hartwell Dam. The exception permits study of pool relocation alternatives for water supply storage that do not sacrifice flood storage capacity.

3. It is acknowledged that the change in the Saddle Dike DSAC has been communicated to the requesters via writing, per Paragraph 24.7.6 of ER 1110-2-1156. The requesters understand that dam safety risks are dynamic and that future performance could require elevated monitoring and evaluation. Additionally, the requesters understand that upon execution of a water supply agreement, they will be required to share the costs of IRRMs and any other remediation consistent with current policy. All requesters have submitted letters of intent stating they understand the cost, accept this risk, and wish to continue with the study.

CECW-EC

SUBJECT: Request for HQUSACE Approval to Continue the Water Supply  
Reallocation Study at Lake Hartwell

4. The point of contact is Jacob R. Davis, HQUSACE Dam Safety Program Manager, at  
(202) 761-4643 or [jacob.r.davis@usace.army.mil](mailto:jacob.r.davis@usace.army.mil).

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LARRY MCCALLISTER, PhD, PE  
Dam Safety Officer  
U.S. Army Corps of Engineers

CF:

CECW-EC (Conforti, Davis)  
CEMP-SPD-RIT (Schwichtenberg)  
CESAD-RB-T (Smith, Hernández)  
CESAS-DE  
CESAS-EN (Hendren)  
CESAS-EN-H (Newberry)

Tentatively Selected Plan Milestone



DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS, SAVANNAH DISTRICT  
100 W. OGLETHORPE AVENUE  
SAVANNAH, GEORGIA 31401-3604

8 June 2020

CESAS-PPMD

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, South Atlantic Division, ATTN: CESAD-PDP (Eric Bush), 60 Forsyth Street, S.W., Atlanta, GA 30303

SUBJECT: Lake Hartwell Water Supply Storage Reallocation Study – Tentatively Selected Plan Milestone Meeting, 29 May 2020.

1. PURPOSE: The purpose of the meeting was to receive vertical team support of the Tentatively Selected Plan (TSP) and actualization of the TSP Milestone.

2. PARTICIPANTS:

- a. SAS (Aaron Wahus, Jamie Sykes, Kim Garvey, Mackie McIntosh, Jeff Morris, Stan Simpson, Brian Choate, George Bramlette, Lisa White, John Moore, Terry Peters)
- b. HAC (Russell Davidson, Brian Shenk)
- c. SAD (Daniel Small, Barbara Altera, Eric Bush, Pat O'Donnell, Debby Scerno, Max Millstein, Matthew Parrish, John Ferguson, J. Palmer, Vivian Davis, Rob Germann, Jose Hernandez, Michael Wolz, Neil Purcell, Frank Ford)
- d. SAJ (Kevin Whittman)
- e. WMRS PCX (Cherilyn Plaxco)
- f. SAD RIT (Sue Wilcox)
- g. ATR Lead (Tacy Jensen)
- h. HQUSACE (Dan Inkelas)

3. REFERENCES:

- a. ER 1110-2-1156, Safety of Dams – Policy and Procedures, 31 March 2014.
- b. MEMORANDUM FOR COMMANDER, SAD DIVISION (CESAD-DE), SUBJECT: Corps Dam Safety Officer Review of the Dam Safety Action Classification for Clemson Lower Diversion Dam Dike (SC02754AS1), CECW-EC, 14 May 2018.

4. BACKGROUND: This study evaluates the feasibility of reallocating existing authorized storage in Hartwell Lake to water supply for four reallocation requests. The objective of this study is to identify the most effective and efficient water supply source to meet water demands of those requestors through the year 2052. Substantial effects to authorized project purposes and/or to the structures and operations shall be avoided.

The four requestors include: Anderson Joint Regional Water Supply (16.05 MGD); City of Lavonia (3 MGD); Pioneer Rural water District (5 MGD); and Currahee Club (0.5



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SUBJECT: Lake Hartwell Water Supply Storage Reallocation Study – Tentatively  
Selected Plan Milestone Meeting, 29 May 2020

MGD). This 24.55 MGD request translates into 20,230 acre-feet of existing storage reallocated to water supply storage. It represents 1.43 percent of the 1,416,000 acre-feet of conservation pool storage at Hartwell Lake and 0.78 percent of the acre-feet of conservation pool storage in the Savannah District's system of multi-purpose projects.

Savannah District operates the three multi-purpose reservoir projects on the Savannah River as a combined system. The District evaluated impacts of withdrawals on the three-reservoir system implementing their inter-related operational rules using HEC ResSim. The storage-yield ratio was evaluated based only on Hartwell Lake, not the system, with no return flow credit to the requestor's account. The 38 cfs that would be required to meet yield requirement equals 0.49% of average reservoir system outflow at JST Dam. Average annual flow at Augusta, GA would decrease 20 cfs over period of record analysis. The average Hartwell Lake elevation would decrease 0.05 feet or 0.55 inches over period of record analysis.

On 14 May 2018, the USACE Dam Safety Senior Oversight Group (DSOG), which evaluates dam safety risks, reclassified Clemson Lower Diversion Dam (CLDD) Dike from a Dam Safety Action Classification (DSAC) 4, Low Urgency, to a DSAC 3, Moderate Urgency. The CLDD Dike was constructed as part of the Hartwell Dam and Lake Project to prohibit Lake Hartwell from spilling into Clemson University property.

As a result of the risk reclassification, reallocation from the Flood Risk Management (FRM) pool for water supply is not permitted per regulation: ER 1110-2-1156, Safety of Dams – Policy and Procedures, 31 Mar 2014. Paragraph 24.4.1.2 states that "A reallocation that would require raising the conservation pool is not permitted *while* a project is classified DSAC 1, 2, or 3."

In addition, the continuation of the Water Supply Reallocation (WSR) study required approval from the USACE Headquarters Dam Safety Officer (DSO). ER 1110-2-1156, 31 Mar 2014, Paragraph 24.7.1, specifically states that "Reallocation Studies are not allowed at projects where a DSAC 1, 2, or 3 is currently assigned to the dam, levees, dikes, or appurtenant structures, *except* when approved by the USACE DSO." SAS received approval from the USACE Headquarters DSO to continue the study on 20 March 2019, if the flood pool storage is not sacrificed.

The PDT eliminated the flood pool storage from further analysis. They estimate that it could take over 20 years for the CLDD Dike to be re-established as a DSAC 4 given its low priority within the USACE dams inventory relative to the large number of higher priority DSAC 1 and 2 dams. Those dams would receive funding before DSAC 3 dams. Additionally, the CLDD Dike ranks at the lower end of all DSAC 3 dams. Plus, the PDT

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estimates that it could cost over \$14 million to re-establish the DSAC 4. Therefore, three alternatives were carried out to the final array of alternatives: No Action Alternative, the Conservation Pool, and the Inactive Pool.

The PDT recommended Hartwell Lake conservation pool storage as the most effective and efficient water supply source because average annual hydropower benefit losses for the conservation pool storage (\$125,013) are less than those for the inactive pool storage (\$142,328).

The PDT analyzed the average annual cost for storage in the conservation pool using three methods: Revenues Foregone (\$84,224); Benefits Foregone or Replacement Cost (\$125,013); or Updated Cost of Storage (\$271,765).

The analysis revealed that the updated cost of storage method provided the highest value within the conservation pool storage. The total cost over the 50-year period of analysis is estimated at \$7,336,894. It represents the amount that would be returned to the U.S. Treasury.

The hydropower revenues foregone method calculates the reduction in revenues accruing to the U.S. Treasury as a result of reducing hydropower outputs, based on existing power sales contract rates charged by the power marketing agency. Those losses represent 0.06 percent of the total hydropower revenues.

The PDT did not identify any NEPA or NHPA compliance issues. Cooperation letters were sent to all natural resource agencies and SEPA. NOAA declined. SEPA, SCDNR, and EPA accepted the invitation to participate as a cooperating agency. SAS met with those agencies on 8 April 2020. On 26 May 2020, all participating agencies including GADNR, SCDNR, EPA, USFWS, USGS, and SEPA participated in a draft findings study meeting. In addition, the PDT meets monthly with the requestors to share two-way information. On 4 May 2020, the PDT met with SEPA to discuss revenues foregone procedures.

The remaining budget of \$18,000 is a constraint on the way forward in FY20, but the target of completing the TSP Milestone Meeting held on 29 May 2020 and getting the TSP actualized by the vertical team was achieved. Remaining funds plan to be spent on preparing the memorandum for record, briefing the requestors and participating agencies, and meeting with the vertical team and requestors to discuss 'return flow credits'.

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As a result of the 8 May 2020 IPR Pre-TSP conversation with the Vertical Team (VT), the PDT addressed presentation concerns posited by the VT prior to the TSP meeting and confirmed that required information would be presented in the report:

- a. The PDT made graphs to display actual proportion. The PDT ensured graphics clearly detailing the correct proportions. Layers had vertical demarcation with appropriate pool sizes, elevations, and hydropower intakes.
- b. The presentation provided information more easily understood by those unfamiliar with the project and information demonstrated the proportional change in total conservation pool storage and total revenues.
- c. The report must include clarification on environmental and cultural resources impacts (i.e., negligible vs. none) and include the environmental analysis at the Hartwell Lake as well as systems approach level.
- d. The report shall provide information about alternative sources other than Hartwell Lake for requestors.
- e. The PDT reached out to all resource agencies especially those that did not respond to coordination letters and ensured they were aware of the alternatives and the TSP by hosting a meeting on 26 May 2020.
- f. Internal and external coordination continues in an attempt to resolve 'return flow credits' to the requestor's accounts.

5. SUMMARY OF MEETING: The Vertical Team actualized the TSP at the 29 May 2020 TSP Milestone Meeting.

- a. Funds available in FY20 limit the PDT from completing the draft report. As a result, the project will be placed on hold until funds become available.
- b. Based on the demand analysis reviewed and approved by the PCX, 100 percent of the requests are substantiated and are recommended for the requestors.
- c. Hydropower benefits were deemed minor.
- d. The Hydropower Analysis Center (HAC) verified that the method used to calculate hydropower benefits is consistent with Altoona.

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- e. It was confirmed that there were no additional risks to the structure, no structural or operational changes, and no serious affects to the authorized project purposes.
- f. All members of the VT had no concerns and supported the TSP.
- g. Eric Bush announced the actualization of the TSP Milestone.

6. DISTRICT'S PLANNED ACTIONS:

SAS prepared the MFR.

7. POINT OF CONTACT: Jeff Morris, Plan Formulation Team Leader, Planning Branch, Planning, Programs, and Project Management Division, 912-652-5008 (office) or 912-257-6507 (cell).

*Kimberly L Garvey*

Kimberly L. Garvey  
Chief, Planning Branch

Planning Bulletin 2013-01

Dam Safety Consideration for Water Supply Storage Allocation and  
Reallocation Studies



**US Army Corps  
of Engineers**

# PLANNING BULLETIN

No. PB 2013-01

Issuing Office: CECW-P

Issued: 11 January 2013

**Subject:** Dam Safety Considerations for Water Supply Storage Allocation and Reallocation Studies

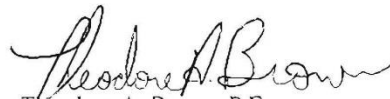
**Applicability:** Guidance

1. Dam safety should be on the critical path of all decisions regarding water supply storage in USACE reservoirs. Public safety is vital consideration. When water supply storage is requested by a non-Federal entity, USACE decision-makers at all levels must fully consider the condition of the dam and associated project levees, Dam Safety Action Classification (DSAC), Interim Risk Reduction Measures (IRRM) and other remediation, and their impacts on pool levels and inspection, operation and maintenance of the project. This guidance supplements the requirements of ER 1105-2-100 Planning Guidance Notebook and other applicable Engineer Regulations and Engineer Circulars.
2. In all cases, prior to initiation of a reallocation study, the non-Federal entity must be informed in writing by the District Commander that dam safety risks are dynamic. Future performance could require IRRM and other remediation. The non-Federal entity must submit a Letter of Intent that includes their understanding of all costs associated with the reallocation.
3. After approval of the reallocation report and associated water supply storage agreement and upon execution of a water supply storage agreement, the non-Federal entity will be required to share in the costs of IRRMs as a part of Operations & Maintenance of the dam, consistent with current policy.
4. Conditions for Allocation and Reallocation should be reflected in the alternative costs, evaluation, comparison and recommendation of the reallocation study documentation. The conditions are as follows:
  - a) DSAC I, II, III, and IV: After approval of the reallocation report and associated water supply storage agreement, execution of an agreement for the allocation of authorized, uncontracted water supply storage or the reallocation of storage from the existing conservation pool is permitted provided the District commander has informed the non-Federal entity, in writing, of the current risks associated with the dam and reservoir; that water supply storage may be reduced by IRRM or other remediation; that the dam may be subject to increased monitoring and evaluation, and that, upon execution of a water storage or surplus water agreement, the non-Federal entity will be required to share in the cost of IRRM and other remediation consistent with current policy.
  - b) DSAC V: Because a dam is a structure that changes over time, the non-Federal entity requesting water supply storage must be informed of the potential of the classification changing and the potential impacts of the change as early as possible.

5. Pool Raises are subject to the following plan formulation constraints.
  - a) DSAC I, II, and III: Reallocation that requires raising the conservation pool will not be permitted.
  - b) DSAC IV: Reallocation that requires raising the conservation pool will be considered by USACE on a case-by-case basis. Reallocation reports recommending a pool raise must include a review of the Potential Failure Mode Analysis (PFMA) for the dam and the effect of a higher pool elevation on dam.
  - c) DSAC V: Reallocation that requires a pool raise must include a review of the PFMA for the dam and an analysis of the effect of a higher pool elevation on the dam.
6. Surplus water agreements and interim-use irrigation agreements are subject to paragraph 2 above. Additionally, upon execution of a surplus water or interim-use irrigation agreement, the non-Federal entity will be required to share in the costs of IRRM and other remediation during the period of the water supply storage contract.
7. Permits for emergency withdrawals of water from USACE reservoirs for municipal and industrial purposes may be issued in accordance with current policy without regard to the project DSAC. District commanders shall inform permit applicants and permit holders, in writing, of any dam safety issues that may affect the quantity of water available for withdrawal.
8. Water supply allocation and reallocation studies are subject to the following:
  - a) A decision by the District Commander to initiate or continue a water supply allocation or reallocation study requires:
    - i) Following the guidance in this planning bulletin and considering all relevant internal and external factors that determine the safety of USACE dams and the potential risks to public safety.
    - ii) Informing, in writing, prior to initiation of a water supply allocation or reallocation study, the non-Federal entity of the current status of the dam and reservoir; restrictions and conditions imposed by this PB; possibility that water supply storage may be reduced by IRRM or other remediation; and that, upon execution of a water storage agreement, the non-Federal entity will be required to share in the costs of IRRM and other remediation.
    - iii) Early consultation with the district Dam Safety Officer, including membership of the DSO (or designee) on the study team. The DSO is responsible for the dam safety evaluations conducted by the team as a part of the study.
  - b) A water supply allocation or reallocation study may be initiated while repair work or other remediation is underway.
  - c) Recommendations submitted to Headquarters USACE must be consistent with the policies of paragraphs 2, 3, and 4 above and must not be conditioned on the completion of work or the upgrading of a dam's condition.
  - d) All other applicable provisions of this Planning Bulletin must be followed.
  - e) The general provisions of this paragraph also apply to studies and assessments supporting use of seasonal conservation storage for water supply purposes, surplus water agreements, interim-use irrigation agreements, and emergency withdrawal permits.
9. Water supply allocations or reallocation studies approved in advance of this Planning Bulletin are subject to its provisions, and the recommended alternative must be evaluated in light of the safety of the dam and life prior to implementation of any agreement. This might result in the need to reevaluate or reformulate a recommended plan.

10. This PB will be incorporated into updates to ER 1110-2-1156 Safety of Dams and ER 1105-2-100 Planning Guidance Notebook.

11. Point of contact for this PB is Bruce Carlson, 202-761-4703.



Theodore A. Brown, P.E.  
Chief, Planning and Policy Division  
Directorate of Civil Works





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**DEPARTMENT OF THE ARMY**  
**SAVANNAH DISTRICT, CORPS OF ENGINEERS**  
**100 W. OGLETHORPE AVENUE**  
**SAVANNAH, GEORGIA 31401-3604**

CESAS-PM-P

7 January 2021

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, South Atlantic Division, ATTN: CESAD-PDP (Ms. Susan Layton), 60 Forsyth Street, S.W., Atlanta, GA 30303

SUBJECT: Hartwell Lake Water Supply Storage Reallocation Study (WSSRS) - Vertical Team Alignment Memorandum (VTAM)

1. References:

- a. Institute for Water Resources (2021). "Technical Considerations in Storage Accounting for USACE Water Supply Agreements."
- b. Engineering Manual (EM) 1110-2-3600 (2017). "Management of Water Control Systems."
- c. Engineering and Construction Bulletin (ECB) 2019-13.
- d. Lake Hartwell Water Supply Storage Reallocation Study – Vertical Team In-Progress Review Teleconference, 8 May 2020.
- e. Lake Hartwell Water Supply Storage Reallocation Study – Tentatively Selected Plan Milestone Meeting, 29 May 2020, dated 8 June 2020.
- f. Hartwell Lake Return Flow Credit Vertical Team Meeting, 20 August 2021, notes dated 12 October 2021.
- g. Lake Hartwell Water Supply Storage Reallocation Study, Vertical Team In-Progress Review Teleconference and Webinar, Reformulation of Water Supply Storage Reallocation Alternatives, 9 April 2018.
- h. Planning Bulletin No. PB 2018-01(S), Feasibility Study Milestones Supplemental Guidance, 20 June 2019.

2. Purpose: Based on recent changes to study scope, schedule, and funding, the following information serves as the basis for this VTAM in accordance with Planning Bulletin 2018-01(S). According to the Water Management and Reallocation Study Planning Center of Expertise (WMRS PCX), this study is not bound to the three-year study limit because it has not been fully funded for at least three consecutive years.

3. Study Scope: This study evaluates the feasibility of reallocating existing authorized storage in Hartwell Lake to water supply for four reallocation requests. The objective of this study is to identify the most effective and efficient water supply source to meet water demands of those requestors through the year 2072. Substantial effects to authorized project purposes and/or to the structures and operations will be avoided. The four requestors and amounts requested include: Anderson Joint Regional Water Supply (16.05 MGD) and Pioneer Rural Water District (5 MGD), both located in South Carolina; and City of Lavonia (3 MGD) and Currahee Club (0.5 MGD), both located in Georgia. The Savannah District (SAS) analysis indicates that this 24.55 MGD request would require reallocation of 20,230 acre-feet of existing storage to water supply storage.

4. Background: The study began in April 2014.

- a. At the 16 September 2016 Alternatives Milestone Meeting (AMM), the Vertical Team (VT) instructed SAS to conduct additional economic analysis (screening-level) before eliminating the option to reallocate water storage from the Flood Risk Management (FRM) pool. In addition, the analysis should only be based on remaining Hartwell Lake storage and not the storage remaining for reallocation from the three-reservoir system within the Chief of Engineer's discretionary authority. The WMRS PCX stated that water supply reallocation studies need to follow the SMART planning principles, but do not need to follow the 3x3x3 criteria.
- b. On 26 September 2016, a SAS/SAD technical meeting was held to address the VT requests at the AMM. Economic losses of reallocating storage from the FRM pool would be greater than from the conservation pool because hydropower losses from both pools were thought to be nearly the same; however, the FRM pool reallocation would have additional losses in terms of Dependable Yield Mitigation Storage and flooding. SAS documented the results in the AMM MFR, dated 13 Oct 2016.
- c. On 28 October 2016, a SAD MFR concurred that the AMM was achieved. The MFR indicated that pending resolution and concurrence by the VT on the use of the FRM pool, SAS should identify the TSP.
- d. On 16 December 2016, HAC stated in an email to SAS/SAD/SAD-RIT/HQ that hydropower impacts, for this study, are not the same when a reallocation is from the Conservation versus the FRM pool. HQ stated that SAS needed to prepare a quantitative analysis to show change in average annual flood damages associated with reallocation from the FRM pool.
- e. On 31 January 2017, an In-Progress Review (IPR) with OWPR, SAD-RIT, WMRS PCX, SAD, and SAS resulted in the VT requiring additional quantitative analysis of hydropower losses and flood damages from reallocating from the FRM pool. On 17 February 2017, a SAS meeting established steps to complete the quantitative analysis requested by VT. Next steps: new tasks, costs, and schedule.

- f. On 28 April 2017 and 3 May 2017, SAS completed the yield analysis for reallocation from the Conservation pool and from the FRM pool, respectively. SAS sent the yield analysis to HAC for modeling of hydropower losses.
- g. On 30 May 2017, SAD and WMRS PCX approved the quantitative approach. On 15 June 2017, an IPR meeting was held with SAD RIT. They stated they were satisfied with the additional technical analysis for the FRM pool decision, subject to approval from SAD on engineering aspects of using the FRM pool. SAD requested analyses using the Hydrologic Engineering Center (HEC) Flood Impact Analysis (FIA) and HEC-Watershed Analysis Tool (WAT) models.
- h. On 21 June 2017, HAC completed hydropower loss analyses for the Conservation and FRM pools. On 24 July 2017, IPR Guidance from SAD required additional work on FRM pool analysis based on Engineering Regulation for Safety of Dams. Dam Safety ER 1110-2-1156 (31 Mar 14), page 24-2 states: "Reallocation reports that recommend pool raises must include a review of the Potential Failure Mode Analysis (PFMA) for the dam and an analysis of the effect of a higher pool elevation on the probability of failure and consequences associated with the changed pool elevation."
- i. On 23 August 2017, SAS updated study cost and schedule to meet Dam Safety requirements.
- j. In March 2018, this study was suspended for one year when the Clemson Lower Diversion Dam Dike was downgraded from a Dam Safety Action Classification (DSAC) 4, Low Urgency, to a DSAC 3, Moderate Urgency. As a result, the FRM pool could no longer be considered for water supply storage reallocation (*ER 1110-2-1156, Safety of Dams – Policy and Procedures, 31 Mar 2014, Paragraph 24.4.1.2*). In addition, the continuation of the Water Supply Reallocation (WSR) study required approval from the USACE Headquarters Dam Safety Officer (DSO) (*ER 1110-2-1156, Safety of Dams – Policy and Procedures, 31 Mar 2014, Paragraph 24.7.1*).
- k. On 9 April 2018, a VT meeting established the final array of alternatives and determined the most efficient path forward to complete the study. Since the Hartwell Lake Project was downgraded to DSAC 3, the FRM pool alternative was eliminated from the final array of alternatives. (Lake Hartwell Water Supply Storage Reallocation Study, Vertical Team In-Progress Review Teleconference and Webinar, 9 April 2018, Reformulation of Water Supply Storage Reallocation Alternatives)
- l. On 14 May 2018, the HQ Deputy Dam Safety Officer required an Interim Risk Reduction Measures Plan (IRRMP) for Clemson Lower Diversion Dam Saddle Dike.
- m. On 26 November 2018, the Savannah District submitted the Final IRRMP and received approval from the South Atlantic Division Dam Safety Officer on 30 November 2018. As a result, on 30 November 2018, the Savannah District submitted a memorandum through the South Atlantic Division Dam Safety Officer for the Headquarters U.S. Army Corps of Engineers Dam Safety Officer requesting an exception to continue this water supply reallocation

- study. It stated “The Clemson Lower Diversion Dam Saddle Dike DSAC rating is primarily a factor of the uncertainty of the foundation conditions of the Dike and the potential for internal erosion leading to failure. However, it was determined that pool restrictions are not a necessary IRRM. Thus, as long as there is no increase in the conservation pool elevation (660 ft-MSL), there is no increased risk incurred on the Saddle Dike.”
- n. On 7 January 2019, the Corps informed the requestors, in writing, by the District Commander, about the Hartwell Dam and Lake project’s updated DSAC 3 classification that indicated an increase in flood risks of the project and associated increased future operation and maintenance costs of the project. A proportion of those costs, related to the proportion of storage under the water supply storage agreements, would be required as payment by non-Federal users. With a DSAC 3 classification, the flood storage no longer could be considered for water supply reallocation purposes. All requestors replied acknowledging their non-Federal responsibility for potential future costs related to modifications of safety standards, understanding that the flood storage could not be considered as a source of water supply storage, and stating that they wish to continue the process for obtaining an increase in water supply storage from Hartwell Lake.
  - o. On 29 January 2019, SAS wrote a request to HQ for an exception to continue the Hartwell Lake Water Supply Storage Reallocation Study, since, according to ER 1110-2-115, paragraph 24.7.1., reallocation studies are not allowed for DSAC 3 projects. On 26 February 2019, the WMRS PCX approved the exception package. On 20 March 2019, HQ approved the exception for SAS to study reallocation alternatives for water supply storage that would not sacrifice flood storage capacity.
  - p. The Tentatively Selected Plan (TSP) Milestone was actualized at the 29 May 2020 TSP Milestone Meeting (MM). At the TSP MM, it was known that funds available in FY20 would limit SAS from completing the Draft Report/EA. Due to those funding constraints, the VT agreed at the TSP MM that SAS could release the Draft Report/EA beyond the PB 2018-01 suggested 60 days from the TSP MM. SAS did not release the Draft Report/EA for concurrent Agency Technical Review (ATR), Legal and Policy Compliance Review (P&LCR), and Public and Agency Review within 60 days from the TSP Milestone actualization date of 29 May 2020. As a result, the project was placed on hold until Workplan SAS Operations Division funds became available in April 2021.
  - q. SAS held a kickoff meeting on 19 April 2021 and began finalizing the Integrated Draft Report/EA and appendices. SAS scheduled to complete the integrated Draft Report/EA and appendices for concurrent review in no more than 60 days from 19 April 2021.
  - r. On 23 April 2021, Daniel Small, SAD, notified Policy and Legal Compliance Review (P&LCR) team members of the status of Hartwell Lake Water Supply Storage Reallocation Report. The Draft Report/EA and appendices were

- scheduled to be completed by 17 June 2021 for concurrent review starting 21 June 2021 ending 11 August 2021.
- s. On 28 May 2021, the Draft Report/EA and appendices were completed within 60 days with prior approval by the WMRS PCX for Supervisory and District Quality Control (DQC) review.
  - t. DQC review was completed 15 June 2021 with high and critical significance of concern requiring substantial updates to the Draft Report/EA and appendices. There were multiple high and critical comments in plan formulation, environmental, and economics.
  - u. The Draft Report/EA was updated to comply with Version 1.0, 24 May 2021, Feasibility Report Format and Content Guide received on 30 June 2021.
  - v. The water demand and alternative analyses for each requestor needed to be recertified by the WMRS PCX since they were greater than 3 years old. On 9 July 2021, the requestors updated data and information in their Water Demand and Alternatives Analyses. On 13 August 2021, the WMRS PCX completed their recertification review of the requestors' water demand analyses. On 24 September 2021, requestors completed their water demand analyses based on the WMRS PCX review for certification. On 29 September 2021, the WMRS PCX recommended certifying the water demand analysis. On 19 October 2021, the requestors were again asked to update the data and information in their Water Demand and Alternatives Analysis using the FY22 Federal discount rate. On 29 October, SAS was in receipt of all requestors' Water Demand and Alternatives Analyses. FY22 Federal discount rate updates were requested from the Hydropower Analysis Center for their benefit analysis appendix, as well. On 15 November 2021, the WMRS PCX certified the water demand analyses.
  - w. On 20 August 2021, SAS held a meeting with Corps VT including HQ (Amy Frantz, Dan Inkelas, Aaron Hostyk, and Sean Smith), WMRS PCX (Tom Jester), and SAD (Daniel Small) to discuss implications of the Assistant Secretary of the Army, Civil Works (ASA(CW)) approval of return flow credits for the Allatoona Lake Water Supply Storage Reallocation Study on the Hartwell Water Supply Storage Reallocation Study. The meeting participants agreed to continue to proceed with the Hartwell Lake Integrated Water Supply Storage Reallocation Study without granting return flow credits. See reference memorandum dated 12 October 2021.

CESAS-PM-P

SUBJECT: Hartwell Lake Water Supply Reallocation Study, Vertical Team Alignment Memo

5. Funding Stream: The study is federally funded and was funded to completion in the FY21 Work Plan. On 21 October 2021, SAS received \$75,000 from SAD. Those were excess funds reprogrammed from SAM Allatoona Water Supply Storage Reallocation Study and added to SAS FY21 funding. As of 20 Nov 2021, \$165,966 is available for completion of the Hartwell Lake WSSRS. In FY22, an additional \$12K was received to complete the four water supply contracts. According to the WMRS PCX, water supply storage reallocation studies have not been bound by the three-year time limit unless the study is fully funded. As seen in the below table, this study has been incrementally funded and not for no more than two-consecutive years.

The funding stream is as follows:

<b>Fiscal Year</b>	<b>Incremental Funding Amount</b>	<b>Expenditures</b>
FY13	\$17,000	\$17,000
FY14	\$250,000	\$226,613
FY15	\$250,000	\$49,290
FY16	0	\$55,258
FY17	\$100,000	\$80,200
FY18	0	\$57,401
FY19	0	\$11,839
FY20	0	\$109,638
FY21	\$260,000	\$89,618
FY22	\$12,000	\$14,177
Total	\$889,000	\$711,034

6. Study Schedule: Based on the current study schedule, the Hartwell WSSRS, to include agreements, is scheduled to be completed in November 2022. The following milestone dates were last updated 3 December 2021.

<b>Milestone</b>	<b>Date</b>
Tentatively Selected Plan	29 May 2020 (A)
DQC Certification of Draft Integrated Report & EA	4 Mar 2022
Release of Draft Report for Concurrent Review (ATR, P&LCR, and Public & Agency Review)	14 Mar 2022
Agency Decision Milestone	29 Apr 2022
DQC of Final Integrated Report & EA	6 Jun 2022
ATR of Final Integrated Report & EA	27 Jul 2022
Final Policy and Legal Compliance Review	1 Aug 2022
Final Report Package Approved by SAD Commander or Director of Civil Works	26 Aug 2022
Signed Director's Report	28 Oct 2022

CESAS-PM-P

SUBJECT: Hartwell Lake Water Supply Reallocation Study, Vertical Team Alignment  
Memo

Water Supply Agreement Approval	25 Nov 2022
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7. Point of Contact: Jeff Morris, Plan Formulation Team Leader, Planning Branch,  
Planning, Programs, and Project Management Division, 912-257-6507.

KIMBERLY L. GARVEY  
Chief, Planning Branch





**DEPARTMENT OF THE ARMY**  
**SAVANNAH DISTRICT, CORPS OF ENGINEERS**  
**100 W. OGLETHORPE AVENUE**  
**SAVANNAH, GEORGIA 31401-3604**

CESAS-PM-P

7 January 2021

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, South Atlantic Division, ATTN: CESAD-PDP (Ms. Susan Layton), 60 Forsyth Street, S.W., Atlanta, GA 30303

SUBJECT: Hartwell Lake Water Supply Storage Reallocation Study (WSSRS) - Vertical Team Alignment Memorandum (VTAM)

1. References:

- a. Institute for Water Resources (2021). "Technical Considerations in Storage Accounting for USACE Water Supply Agreements."
- b. Engineering Manual (EM) 1110-2-3600 (2017). "Management of Water Control Systems."
- c. Engineering and Construction Bulletin (ECB) 2019-13.
- d. Lake Hartwell Water Supply Storage Reallocation Study – Vertical Team In-Progress Review Teleconference, 8 May 2020.
- e. Lake Hartwell Water Supply Storage Reallocation Study – Tentatively Selected Plan Milestone Meeting, 29 May 2020, dated 8 June 2020.
- f. Hartwell Lake Return Flow Credit Vertical Team Meeting, 20 August 2021, notes dated 12 October 2021.
- g. Lake Hartwell Water Supply Storage Reallocation Study, Vertical Team In-Progress Review Teleconference and Webinar, Reformulation of Water Supply Storage Reallocation Alternatives, 9 April 2018.
- h. Planning Bulletin No. PB 2018-01(S), Feasibility Study Milestones Supplemental Guidance, 20 June 2019.

2. Purpose: Based on recent changes to study scope, schedule, and funding, the following information serves as the basis for this VTAM in accordance with Planning Bulletin 2018-01(S). According to the Water Management and Reallocation Study Planning Center of Expertise (WMRS PCX), this study is not bound to the three-year study limit because it has not been fully funded for at least three consecutive years.

3. Study Scope: This study evaluates the feasibility of reallocating existing authorized storage in Hartwell Lake to water supply for four reallocation requests. The objective of this study is to identify the most effective and efficient water supply source to meet water demands of those requestors through the year 2072. Substantial effects to authorized project purposes and/or to the structures and operations will be avoided. The four requestors and amounts requested include: Anderson Joint Regional Water Supply (16.05 MGD) and Pioneer Rural Water District (5 MGD), both located in South Carolina; and City of Lavonia (3 MGD) and Currahee Club (0.5 MGD), both located in Georgia. The Savannah District (SAS) analysis indicates that this 24.55 MGD request would require reallocation of 20,230 acre-feet of existing storage to water supply storage.

4. Background: The study began in April 2014.

- a. At the 16 September 2016 Alternatives Milestone Meeting (AMM), the Vertical Team (VT) instructed SAS to conduct additional economic analysis (screening-level) before eliminating the option to reallocate water storage from the Flood Risk Management (FRM) pool. In addition, the analysis should only be based on remaining Hartwell Lake storage and not the storage remaining for reallocation from the three-reservoir system within the Chief of Engineer's discretionary authority. The WMRS PCX stated that water supply reallocation studies need to follow the SMART planning principles, but do not need to follow the 3x3x3 criteria.
- b. On 26 September 2016, a SAS/SAD technical meeting was held to address the VT requests at the AMM. Economic losses of reallocating storage from the FRM pool would be greater than from the conservation pool because hydropower losses from both pools were thought to be nearly the same; however, the FRM pool reallocation would have additional losses in terms of Dependable Yield Mitigation Storage and flooding. SAS documented the results in the AMM MFR, dated 13 Oct 2016.
- c. On 28 October 2016, a SAD MFR concurred that the AMM was achieved. The MFR indicated that pending resolution and concurrence by the VT on the use of the FRM pool, SAS should identify the TSP.
- d. On 16 December 2016, HAC stated in an email to SAS/SAD/SAD-RIT/HQ that hydropower impacts, for this study, are not the same when a reallocation is from the Conservation versus the FRM pool. HQ stated that SAS needed to prepare a quantitative analysis to show change in average annual flood damages associated with reallocation from the FRM pool.
- e. On 31 January 2017, an In-Progress Review (IPR) with OWPR, SAD-RIT, WMRS PCX, SAD, and SAS resulted in the VT requiring additional quantitative analysis of hydropower losses and flood damages from reallocating from the FRM pool. On 17 February 2017, a SAS meeting established steps to complete the quantitative analysis requested by VT. Next steps: new tasks, costs, and schedule.

- f. On 28 April 2017 and 3 May 2017, SAS completed the yield analysis for reallocation from the Conservation pool and from the FRM pool, respectively. SAS sent the yield analysis to HAC for modeling of hydropower losses.
- g. On 30 May 2017, SAD and WMRS PCX approved the quantitative approach. On 15 June 2017, an IPR meeting was held with SAD RIT. They stated they were satisfied with the additional technical analysis for the FRM pool decision, subject to approval from SAD on engineering aspects of using the FRM pool. SAD requested analyses using the Hydrologic Engineering Center (HEC) Flood Impact Analysis (FIA) and HEC-Watershed Analysis Tool (WAT) models.
- h. On 21 June 2017, HAC completed hydropower loss analyses for the Conservation and FRM pools. On 24 July 2017, IPR Guidance from SAD required additional work on FRM pool analysis based on Engineering Regulation for Safety of Dams. Dam Safety ER 1110-2-1156 (31 Mar 14), page 24-2 states: "Reallocation reports that recommend pool raises must include a review of the Potential Failure Mode Analysis (PFMA) for the dam and an analysis of the effect of a higher pool elevation on the probability of failure and consequences associated with the changed pool elevation."
- i. On 23 August 2017, SAS updated study cost and schedule to meet Dam Safety requirements.
- j. In March 2018, this study was suspended for one year when the Clemson Lower Diversion Dam Dike was downgraded from a Dam Safety Action Classification (DSAC) 4, Low Urgency, to a DSAC 3, Moderate Urgency. As a result, the FRM pool could no longer be considered for water supply storage reallocation (*ER 1110-2-1156, Safety of Dams – Policy and Procedures, 31 Mar 2014, Paragraph 24.4.1.2*). In addition, the continuation of the Water Supply Reallocation (WSR) study required approval from the USACE Headquarters Dam Safety Officer (DSO) (*ER 1110-2-1156, Safety of Dams – Policy and Procedures, 31 Mar 2014, Paragraph 24.7.1*).
- k. On 9 April 2018, a VT meeting established the final array of alternatives and determined the most efficient path forward to complete the study. Since the Hartwell Lake Project was downgraded to DSAC 3, the FRM pool alternative was eliminated from the final array of alternatives. (Lake Hartwell Water Supply Storage Reallocation Study, Vertical Team In-Progress Review Teleconference and Webinar, 9 April 2018, Reformulation of Water Supply Storage Reallocation Alternatives)
- l. On 14 May 2018, the HQ Deputy Dam Safety Officer required an Interim Risk Reduction Measures Plan (IRRMP) for Clemson Lower Diversion Dam Saddle Dike.
- m. On 26 November 2018, the Savannah District submitted the Final IRRMP and received approval from the South Atlantic Division Dam Safety Officer on 30 November 2018. As a result, on 30 November 2018, the Savannah District submitted a memorandum through the South Atlantic Division Dam Safety Officer for the Headquarters U.S. Army Corps of Engineers Dam Safety Officer requesting an exception to continue this water supply reallocation

- study. It stated “The Clemson Lower Diversion Dam Saddle Dike DSAC rating is primarily a factor of the uncertainty of the foundation conditions of the Dike and the potential for internal erosion leading to failure. However, it was determined that pool restrictions are not a necessary IRRM. Thus, as long as there is no increase in the conservation pool elevation (660 ft-MSL), there is no increased risk incurred on the Saddle Dike.”
- n. On 7 January 2019, the Corps informed the requestors, in writing, by the District Commander, about the Hartwell Dam and Lake project’s updated DSAC 3 classification that indicated an increase in flood risks of the project and associated increased future operation and maintenance costs of the project. A proportion of those costs, related to the proportion of storage under the water supply storage agreements, would be required as payment by non-Federal users. With a DSAC 3 classification, the flood storage no longer could be considered for water supply reallocation purposes. All requestors replied acknowledging their non-Federal responsibility for potential future costs related to modifications of safety standards, understanding that the flood storage could not be considered as a source of water supply storage, and stating that they wish to continue the process for obtaining an increase in water supply storage from Hartwell Lake.
  - o. On 29 January 2019, SAS wrote a request to HQ for an exception to continue the Hartwell Lake Water Supply Storage Reallocation Study, since, according to ER 1110-2-115, paragraph 24.7.1., reallocation studies are not allowed for DSAC 3 projects. On 26 February 2019, the WMRS PCX approved the exception package. On 20 March 2019, HQ approved the exception for SAS to study reallocation alternatives for water supply storage that would not sacrifice flood storage capacity.
  - p. The Tentatively Selected Plan (TSP) Milestone was actualized at the 29 May 2020 TSP Milestone Meeting (MM). At the TSP MM, it was known that funds available in FY20 would limit SAS from completing the Draft Report/EA. Due to those funding constraints, the VT agreed at the TSP MM that SAS could release the Draft Report/EA beyond the PB 2018-01 suggested 60 days from the TSP MM. SAS did not release the Draft Report/EA for concurrent Agency Technical Review (ATR), Legal and Policy Compliance Review (P&LCR), and Public and Agency Review within 60 days from the TSP Milestone actualization date of 29 May 2020. As a result, the project was placed on hold until Workplan SAS Operations Division funds became available in April 2021.
  - q. SAS held a kickoff meeting on 19 April 2021 and began finalizing the Integrated Draft Report/EA and appendices. SAS scheduled to complete the integrated Draft Report/EA and appendices for concurrent review in no more than 60 days from 19 April 2021.
  - r. On 23 April 2021, Daniel Small, SAD, notified Policy and Legal Compliance Review (P&LCR) team members of the status of Hartwell Lake Water Supply Storage Reallocation Report. The Draft Report/EA and appendices were

- scheduled to be completed by 17 June 2021 for concurrent review starting 21 June 2021 ending 11 August 2021.
- s. On 28 May 2021, the Draft Report/EA and appendices were completed within 60 days with prior approval by the WMRS PCX for Supervisory and District Quality Control (DQC) review.
  - t. DQC review was completed 15 June 2021 with high and critical significance of concern requiring substantial updates to the Draft Report/EA and appendices. There were multiple high and critical comments in plan formulation, environmental, and economics.
  - u. The Draft Report/EA was updated to comply with Version 1.0, 24 May 2021, Feasibility Report Format and Content Guide received on 30 June 2021.
  - v. The water demand and alternative analyses for each requestor needed to be recertified by the WMRS PCX since they were greater than 3 years old. On 9 July 2021, the requestors updated data and information in their Water Demand and Alternatives Analyses. On 13 August 2021, the WMRS PCX completed their recertification review of the requestors' water demand analyses. On 24 September 2021, requestors completed their water demand analyses based on the WMRS PCX review for certification. On 29 September 2021, the WMRS PCX recommended certifying the water demand analysis. On 19 October 2021, the requestors were again asked to update the data and information in their Water Demand and Alternatives Analysis using the FY22 Federal discount rate. On 29 October, SAS was in receipt of all requestors' Water Demand and Alternatives Analyses. FY22 Federal discount rate updates were requested from the Hydropower Analysis Center for their benefit analysis appendix, as well. On 15 November 2021, the WMRS PCX certified the water demand analyses.
  - w. On 20 August 2021, SAS held a meeting with Corps VT including HQ (Amy Frantz, Dan Inkelas, Aaron Hostyk, and Sean Smith), WMRS PCX (Tom Jester), and SAD (Daniel Small) to discuss implications of the Assistant Secretary of the Army, Civil Works (ASA(CW)) approval of return flow credits for the Allatoona Lake Water Supply Storage Reallocation Study on the Hartwell Water Supply Storage Reallocation Study. The meeting participants agreed to continue to proceed with the Hartwell Lake Integrated Water Supply Storage Reallocation Study without granting return flow credits. See reference memorandum dated 12 October 2021.

CESAS-PM-P

SUBJECT: Hartwell Lake Water Supply Reallocation Study, Vertical Team Alignment Memo

5. Funding Stream: The study is federally funded and was funded to completion in the FY21 Work Plan. On 21 October 2021, SAS received \$75,000 from SAD. Those were excess funds reprogrammed from SAM Allatoona Water Supply Storage Reallocation Study and added to SAS FY21 funding. As of 20 Nov 2021, \$165,966 is available for completion of the Hartwell Lake WSSRS. In FY22, an additional \$12K was received to complete the four water supply contracts. According to the WMRS PCX, water supply storage reallocation studies have not been bound by the three-year time limit unless the study is fully funded. As seen in the below table, this study has been incrementally funded and not for no more than two-consecutive years.

The funding stream is as follows:

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6. Study Schedule: Based on the current study schedule, the Hartwell WSSRS, to include agreements, is scheduled to be completed in November 2022. The following milestone dates were last updated 3 December 2021.

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Final Policy and Legal Compliance Review	1 Aug 2022
Final Report Package Approved by SAD Commander or Director of Civil Works	26 Aug 2022
Signed Director's Report	28 Oct 2022

CESAS-PM-P

SUBJECT: Hartwell Lake Water Supply Reallocation Study, Vertical Team Alignment  
Memo

Water Supply Agreement Approval	25 Nov 2022
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7. Point of Contact: Jeff Morris, Plan Formulation Team Leader, Planning Branch,  
Planning, Programs, and Project Management Division, 912-257-6507.

KIMBERLY L. GARVEY  
Chief, Planning Branch



998 Hunters Trail  
Phone: 864-332-6534

Anderson, SC 29625  
Fax: 864-224-6116

February 22, 2022

Col. Joseph R. Geary, PhD, PE  
District Commander  
U.S. Army Corps of Engineers, Savannah District  
100 W. Oglethorpe Ave  
Savannah, GA 31401

Re: Return Flow Crediting for Reallocated Storage

Colonel Geary:

Please consider this a formal request for return flow credits for Anderson Regional Joint Water System (Anderson Regional Water) in the pending Lake Hartwell Storage Reallocation Study. As of this moment, we believe that return flow crediting will be directed by an amended SC Code 49-3-60 in short order as the required bills are moving through the SC legislature with unanimous support that is also consistent with Georgia Code. We further ask that activities and expenditures inconsistent with return flow crediting be suspended.

Anderson Regional Water embarked on its quest for water storage rights sufficient to meet its 50 year planning needs in 2011. We have diligently participated in required submissions and project update meetings as well as national efforts to revise the Water Resources Development Act and the Water Supply Rule. During those meetings we have consistently argued for the inclusion of return flow credits in federal water projects, not just in the Western US.

Initially, our project specific requests were informal, relying on support from changes in Georgia state water regulation in 2014 (which could bear on shared water resources) and the update to the Water Supply Rule (ultimately withdrawn January 2021). Beginning 11 December 2019 our requests have been more direct, including submission of actual return flow volumes on 28 January 2020. Throughout 2020-21, Corps' staff indicated that the issue was undecided and under consideration. In October 2021, we provided additional information regarding the successful inclusion of return flow credits in the Cobb County Marietta Water Authority's Lake Allatoona permit (South Atlantic Division) to Corps' study staff of notice of our intent to obtain similar return flow credits.

In October 2021, we were informed by project staff that absent specific state legislation or regulation return flows would not be considered despite the potential disparate impacts on the reallocation study proponents. Via identical bills, SC Senate 1010 and SC House 4778, Anderson Regional Water began seeking state legislation equivalent to that in Georgia and Tennessee that the Corps has found sufficient to provide return flow crediting. Both bills have



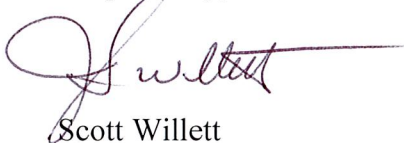
February 22, 2022  
Page 2 of 2

been strongly supported by the county legislative delegations along the upper Savannah River and have been unanimously approved in Senate and House committees and the full SC Senate. Today the SC House unanimously approved a required second reading. We have routinely shared status of the legislation with the project team.

Anderson Regional Water does not believe that return flow crediting significantly impacts the base hydraulic model, as a well calibrated model already includes the net withdrawals. If municipal and industrial return flows are currently included with natural inflows, the model may actually overestimate the impact of the withdrawals during periods of drought as the return flows are not impacted by low precipitation levels. It is our contention that return flow crediting affects only project-level storage accounting models used to determine sufficiency of contract holder rights.

Please let me know if you have any questions.

Respectfully,



Scott Willett  
Executive Director

Cc:

Erik Blechinger, Deputy District Engineer for Planning, Programs, and Project Management  
Kim Garvey, Chief, Planning Branch  
Mike Montone, Chief, Operations Division

MEMORANDUM FOR Mrs. Susan Layton, Acting Chief of Planning and Policy Division (CESAD-PDP), U.S. Army Corps of Engineers, 60 Forsyth Street SW, Room 10M15, Atlanta, Georgia 30303

SUBJECT: Hartwell Lake Return Flow Credit Vertical Team Meeting, 31 March 2022

1. Purpose and Scope: The purpose of the subject meeting was to meet with the Corps Vertical Team (VT) to seek advice and confirm guidance, if applicable, from HQUSACE and the Water Management and Reallocation Studies Planning Center of Expertise (PCX) on whether Savannah District (SAS) should include a return flow credit alternative to the Hartwell Water Supply Reallocation Study (WSRS) and review several possible study courses of actions.

2. Participants:

- a. SAS (Kim Garvey, Jeff Morris, Stan Simpson, Jamie Sykes, Melissa Wolf, Aaron Wahus, Sandy Campbell, John Moore, Terry Peters)
- b. HQUSACE (Dan Inkelas, Aaron Hostyk, Sean Smith, Sue Wilcox)
- c. WMRS PCX (Meredith LaDart)
- d. SAD (Daniel Small, Susan Layton, Trent Ferguson, Matthew Parish, Neil Purcell)

3. References:

- a. Institute for Water Resources (2021). "Technical Considerations in Storage Accounting for USACE Water Supply Agreements."
- b. Engineering Manual (EM) 1110-2-3600 (2017). "Management of Water Control Systems."
- c. Engineering and Construction Bulletin (ECB) 2019-13
- d. MEMORANDUM FOR COMANDING GENERAL, U.S. ARMY CORPS OF ENGINEERS, SUBJECT: Alabama-Coosa-Tallapoosa (ACT) River Basin – Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Water Control Manuals, 3 August 2021.
- e. MEMORANDUM FOR Mrs. Susan Layton, SUBJECT: Hartwell Lake Return Flow Credit Vertical Team Meeting, 20 August 2021.

4. Background: The Hartwell Water Supply Reallocation Study is evaluating the feasibility of reallocating existing authorized storage in Hartwell Lake to water supply for four reallocation requests. The four requestors and amounts requested include: Anderson Joint Regional Water Supply (16.05 MGD) and Pioneer Rural Water District (5 MGD), both located in South Carolina; and City of Lavonia (3 MGD); and Currahee Club (0.5 MGD); both located in Georgia. The SAS analysis indicates that this 24.55 MGD request would require reallocation of 20,230 acre-feet of existing storage to water supply storage.

The vertical team recommended in the 21 August 2021 meeting to continue to proceed with the Hartwell Lake Integrated Water Supply Storage Reallocation Study without granting return flow credits. The team discussed potential application of return flow credit to the four requestors. Only one representative of these requestors, Scott Willett, Executive Director of Anderson Joint Regional Water System, had verbally asked for return flow credit on multiple occasions.

5. Summary of Meeting: The team discussed whether we should include a return flow credit alternative to the Hartwell Water Supply Reallocation Study (WSRS) and several possible study courses of action to include schedule impacts and risks. The draft Hartwell WSRS integrated report does not currently have a return flow credit alternative and the study's Res-Sim model is not configured to account for return flow crediting. Only one of the four requestors have formally requested return flow credits; SAS received Anderson Regional Joint Water System's letter requesting return flow credits on 22 February 2022. Due to this requestor's efforts, South Carolina has introduced pending state legislation to require return flow credits to the user's storage accounts. We understand the pending South Carolina legislation is worded after the Tennessee return flow credit state law.

6. Meeting participants made the following observations:

- a. The team reviewed three courses of action (COA) for Hartwell WSRS:
  - 1) COA #1: Release the draft report "as is" without a return flow credit alternative and remove Anderson Joint Regional Water System from current report to address their return flow credit in a separate report. Risks include pursuing contributed funds, a likely 6–12-month process, and then it would take 12-18 additional months to revise the model (ResSim) and create new report after contributed funds provided, and South Carolina congressional interest anticipated.
  - 2) COA #2: Hold the draft report and revise Hartwell WSRS' model (ResSim) to develop the return flow credit alternative before draft release. Risks include minimum 8-month delay in completing the draft report, \$100K additional costs for ResSim scripting/modeling and report edits before

Agency Decision Milestone (ADM), and additional funding source will need to be determined.

- 3) COA #3: Release the draft report “as is” for concurrent reviews, to include public and agency review, without a return flow credit alternative. Revise Hartwell WSRS’ model (ResSim) concurrent with draft report’s public and agency reviews. Model the return flow alternative with revised ResSim during draft review and incorporate return flow alternative into the Final Report. Risks include 6-month delay in Final Report approval, \$100K additional required for ResSim and report edits before agreement approval, additional funding source will need to be determined, draft integrated report and NEPA reviewed without return flow credit alternative and assumes no additional hydropower impact assessment required from HAC.
- b. Current Hartwell WSRS schedule summary, to include study history, and a modified study schedule summary to include COA #3 return flow credit alternative was shared. Hartwell WSRS has received \$877K study funds, \$12K to draft agreements, with \$134K available to date. There are not enough funds to complete study and fund the additional \$100K COA #2&3 for ResSim scripting/modeling and report edits. Additional funding source will need to be determined.
- c. While reviewing COA slide, it was pointed out that if return flow credits are granted, the storage account methodology for Anderson Joint Regional Water System’s current agreement would also change. It was discussed that return flow credits on Anderson Joint Regional Water System’s current agreement would likely significantly reduce their required reallocation request.
- d. COA #3 was the Hartwell WSRS PDT’s recommended course of action. After discussions of the alternatives and associated risks, vertical team recommended COA #2 due to similar schedule but lower risk.
- e. It was stated that other requestors account size will be adjusted with return flow credited to a particular user.
- f. It was stated that return flows include flows returned to tributaries and directly to Hartwell Lake.
- g. It was discussed if South Carolina state law is not passed, whether not having a state return flow credit law affects Corps consideration of return flow credits on the Hartwell WSRS. Dan Inkelas, HQUSACE, stated the South Carolina law is not a requirement or would compel us to entertain return flow credits. He stated he does not think it would be a legal conflict but likely an argument.
- h. It was stated that including a return flow credit alternative does not automatically require ASA approval of the report. Study report is delegated to Director of Civil Works, Mr. Lee. It was further mentioned that Mr. Lee might decide to get concurrence from ASA due to inclusion of return flow credits but that is yet to be determined. It was suggested to brief Mr. Lee, deciding

- official, on the vertical team's return flow credit guidance resulting from this meeting so all are confident he is bought in direction when final report is sent to him for approval. Susan Layton, SAD, stated she would brief Mr. Bush and recommend getting concurrence from Mr. Lee on study path forward.
- i. It was discussed that the other three requestors now must wait longer for the study to be completed due to one requestor wanting return flow credits. Team discussed concerns over them waiting and not having adequate storage, especially in drought conditions.
7. Vertical team recommends Course of Action #2: hold the draft report and revise Hartwell WSRS' model (ResSim) to develop the return flow credit alternative before draft release. The meeting participants also agreed that SAS/SAD needs to assist PDT in finding more study funding and confirm Director of Civil Works/ASA stance on return flow credits.
  8. Point of Contact: Kim Garvey, Chief, Planning Branch, Planning, Programs, and Project Management Division, 912-257-5968.

KIMBERLY L. GARVEY  
Chief, Planning Branch

# HARTWELL LAKE WATER SUPPLY REALLOCATION

## VERTICAL TEAM MEETING – RETURN FLOW CREDITS



*"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."*



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# HARTWELL STORAGE USERS



## Hartwell Lake Water Supply Existing Agreements

Project	Recipient	Acre Feet of Water	Reallocated From	Date of Approval
Hartwell, GA & SC	ARJWS, SC	24,620	Conservation	1967
	City of Lavonia, GA	127	Conservation	1990
	Hart County, GA	1,827	Conservation	1998
	<b>Total</b>	<b>26,574</b>		

## Hartwell Lake Water Supply Reallocation Requests

Requestor	New Request (MGD)	New Request (Acre-Feet)	Total User Cost	Annual Cost 50-Year POA	Annual Cost 30-Year Payment
ARJWS, SC	16.05	13,226	\$5,100,054	\$170,945	\$235,619
City of Lavonia, GA	3.0	2,472	\$1,588,706	\$53,251	\$73,397
Pioneer RWD, SC	5.0	4,120	\$953,223	\$31,950	\$44,038
Currahee Club, GA	0.5	412	\$158,871	\$5,325	\$7,340
<b>Total</b>	<b>24.55</b>	<b>20,230</b>	<b>\$7,800,854</b>	<b>\$261,472</b>	<b>\$360,394</b>





# COURSES OF ACTION AT HARTWELL \*ASSUMING SC PASSES LAW



- Release the draft report "as is" without an RFC alternative
- Remove Anderson Regional to address RFC in a separate report
- Risks: Pursue contributed funds (6-12-month process)
- 12-18 additional months to revise model (ResSim) and create new report after contributed funds provided
- Congressional Interest

- Hold the draft report and revise model (ResSim) to develop the RFC alternative before draft release
- Risks: minimum 8-month delay in completing draft report
- \$100K additional for ResSim and report edits before ADM
- Additional funding source TBD

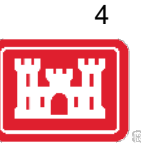
- Release the draft report "as is" without an RFC alternative
- Revise ResSim concurrent with draft report agency/public review
- Model the RFC alternative with revised ResSim during draft review and incorporate RFC alternative into the Final Report
- Risks: 6-month delay in Final Report approval
- \$100K additional required for ResSim and report edits before agreement approval
- Additional funding source TBD
- Draft Integrated Report and NEPA reviewed without RFC alternative
- Assumes no additional hydropower impact assessment required from HAC

If RFC granted, the storage accounting methodology for Anderson Regional's current agreement would also change.





# HARTWELL WATER SUPPLY REALLOCATION STUDY (WSRS) MILESTONES



4

Task Name	ACTUAL	Start Date	Completion Date	Status
Hartwell WSRS Initiated	4 non-federal requestors; rec'd \$877K total (FY14,15,17, 21)	1-Apr-2014	NA	ACTUAL
1-YR Hold on Study	Study suspended due to Clemson Lower Diversion Dam Saddle Dike DSAC Rating downgrade	12-Mar-2018	20-Mar-2019	ACTUAL
Interim Risk Reduction Plan Approved	IRRP for Clemson Lower Diversion Dam Saddle Dike	NA	6-Dec-2018	ACTUAL
HQ/SAD Approved Waiver	Waiver to Continue Study (3x3x3 NA)	NA	20-Mar-2019	ACTUAL
Prepare Integrated Draft Report/EA	H&H Analysis, HAC Analysis, Economic Analysis, &Environmental Assessment completed Apr 19-Apr 20 in preparation of report	14-Feb-2020	10 Oct 2020	ACTUAL
Tentatively Selected Plan Milestone	SAD IPR Pre-TSP- completed 8 May 2020	29 May 2020	29 May 2020	ACTUAL
Study Pause Awaiting Funds	FY21 Work Plan funding of \$185K approved and funds received	29 May 2020	19 Apr 2021	ACTUAL
Complete Integrated Draft Report/EA/FONSI	Update Draft Report/EA/FONSI (includes Supervisory Review) Update report due to DQC findings, new WS format guide, additional requestor data	19 Apr 2021	17 Mar 2022	ACTUAL
District Quality Control (DQC) Review	DQC Review of Integrated Draft Report, EA, & FONSI Note- Requestor review scheduled 18-22 Apr 2022	21 Mar 2022	15 Apr 2022	
Agency Technical Review (ATR), Policy & Legal Compliance Review, & Public & Agency Review	Concurrent Review of Integrated Draft Report/EA/FONSI	2 May 2022	3 Jun 2022	
Agency Decision (AD) Milestone	Prepare, <b>AD Milestone Meeting 1 Jul 2022</b> , and Follow-up Documentation	6 Jun 2022	8 Jul 2022	
Complete Final Draft Integrated Report/EA & Agreements	EN-H, HAC, PM-P, OP	27 Jun 2022	22 Jul 2022	
Review of Final Draft Integrated Report/EA & Agreements	DQC Team, ATR Team, PDT, SAD, and Director of Civil Works approval of director report Note- ASA 7 Apr 2020 memo & USACE 18 May 2020 memo delegate study approval to Director of Civil Works.	25 Jul 2022	23 Dec 2022	
Water Supply Agreements-ASA(CW) Approval	Assistant Secretary of Army Approval & Agreements executed with 4 non-federal requestors Note- ASA 7 Apr 2020 memo & USACE 18 May 2020 memo delegate agreement approval to SAD Commander	2 Jan 2023	27 Jan 2023	

Red Overdue

Amber within 30 days

Green Due within 90 Days

Updated 30 Mar 2022



# HARTWELL WATER SUPPLY REALLOCATION STUDY (WSRS) MILESTONES- (COA#3-RFC)



Task Name	ACTUAL	Start Date	Completion Date	Status
Hartwell WSRS Initiated	4 non-federal requestors; rec'd \$877K total (FY14,15,17, 21)	1-Apr-2014	NA	ACTUAL
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HQ/SAD Approved Waiver	Waiver to Continue Study (3x3x3 NA)	NA	20-Mar-2019	ACTUAL
Prepare Integrated Draft Report/EA	H&H Analysis, HAC Analysis, Economic Analysis, &Environmental Assessment completed Apr 19-Apr 20 in preparation of report	14-Feb-2020	10 Oct 2020	ACTUAL
Tentatively Selected Plan Milestone	SAD IPR Pre-TSP- completed 8 May 2020	29 May 2020	29 May 2020	ACTUAL
Study Pause Awaiting Funds	FY21 Work Plan funding of \$185K approved and funds received	29 May 2020	19 Apr 2021	ACTUAL
Complete Integrated Draft Report/EA/FONSI	Update Draft Report/EA/FONSI (includes Supervisory Review)	19 Apr 2021	17 Mar 2022	ACTUAL
District Quality Control (DQC) Review	DQC Review of Integrated Draft Report, EA, & FONSI Note- Requestor review scheduled 18-22 Apr 2022	21 Mar 2022	15 Apr 2022	
Agency Technical Review (ATR), Policy & Legal Compliance Review, & Public & Agency Review	Concurrent Review of Integrated Draft Report/EA/FONSI	2 May 2022	17 Jun 2022	
Update RES-SIM Script/Run Model for Return Flow Credit Alternative	Estimate 6 months to update RES-SIM Script/Run Model, 1 month to Verify Model, and 1 Month to Update Report (estimated 6-month study delay)	3 Apr 2022	2 Dec 2022	
Agency Decision (AD) Milestone	Prepare, <b>AD Milestone Meeting 1 Jul 2022</b> , and Follow-up Documentation	6 Jun 2022	8 Jul 2022	
Complete Final Draft Integrated Report/EA & Agreements	EN-H, HAC, PM-P, OP	27-Jun-2022 17 Jan 2023	22-Jul-2022 10 Feb 2023	
Review of Final Draft Integrated Report/EA & Agreements	DQC Team, ATR Team, PDT, SAD, and Director of Civil Works approval of director report Note- ASA 7 Apr 2020 memo & USACE 18 May 2020 memo delegate study approval to Director of Civil Works.	25-Jul-2022 13 Feb 2023	23-Dec-2022 7 Jul 2023	
Water Supply Agreements-ASA(CW) Approval	Assistant Secretary of Army Approval & Agreements executed with 4 non-federal requestors Note- ASA/USACE 2020 memos delegate agreement approval to SAD Commander	2-Jan-2023 10 Jul 2023	27-Jan-2023 4 Aug 2023	

Red Overdue    Amber within 30 days    Green Due within 90 Days

MEMORANDUM FOR Mrs. Susan Layton, Acting Chief of Planning and Policy Division (CESAD-PDP), U.S. Army Corps of Engineers, 60 Forsyth Street SW, Room 10M15, Atlanta, Georgia 30303

SUBJECT: Hartwell Lake Return Flow Credit Vertical Team Meeting, 20 August 2021

1. Purpose and Scope: The purpose of the subject meeting was to meet with the Corps Vertical Team (VT) to discuss implications of the Assistant Secretary of the Army, Civil Works (ASA(CW)) approval of return flow credits for the Allatoona Lake Water Supply Storage Reallocation Study on the Hartwell Water Supply Reallocation Study. (Allatoona Lake Study) (See 3d below.) The intent of the meeting was to seek advice and confirm guidance, if applicable, from HQUSACE and the Water Management and Reallocation Studies Planning Center of Expertise (PCX) on whether Savannah District (SAS) should model additional storage accounting methods providing return flow credits and include an alternative for return flow credits for the four current water supply storage reallocation requests at Hartwell Lake.

2. Participants:

- a. SAS (Kim Garvey, Jeff Morris, Stan Simpson, Jamie Sykes, Aaron Wahus, Sandy Campbell, John Moore)
- b. HQUSACE (Amy Frantz, Dan Inkelas, Aaron Hostyk, Sean Smith)
- c. WMRS PCX (Tom Jester)
- d. SAD (Daniel Small)

3. References:

- a. Institute for Water Resources (2021). "Technical Considerations in Storage Accounting for USACE Water Supply Agreements."
- b. Engineering Manual (EM) 1110-2-3600 (2017). "Management of Water Control Systems."
- c. Engineering and Construction Bulletin (ECB) 2019-13
- d. MEMORANDUM FOR COMANDING GENERAL, U.S. ARMY CORPS OF ENGINEERS, SUBJECT: Alabama-Coosa-Tallapoosa (ACT) River Basin – Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Water Control Manuals, 3 August 2021.

4. Background: The Hartwell Water Supply Reallocation Study is evaluating the feasibility of reallocating existing authorized storage in Hartwell Lake to water supply for four reallocation requests. The four requestors and amounts requested include: Anderson Joint Regional Water Supply (16.05 MGD) and Pioneer Rural Water District (5 MGD), both located in South Carolina; and City of Lavonia (3 MGD); and Currahee Club (0.5 MGD); both located in Georgia. The SAS analysis indicates that this 24.55 MGD request would require reallocation of 20,230 acre-feet of existing storage to water supply storage.

5. Summary of Meeting: The team discussed potential application of return flow credit to the four requestors noted above. Only one representative of these requestors, Scott Willett, Executive Director of Anderson Joint Regional Water System, has asked for return flow credit. He asked the team this question during the 11 December 2019 telephonic conference between the Corps and representatives of the four requestors.

6. Meeting participants made the following observations:

a. The Allatoona Lake Study's approval of a revised storage accounting method providing full credit for "made inflows" is specific to the Allatoona study and does not represent an official Corps of Engineers (Corps) policy or a change to the general practice in relation to applicability of return flow credits. The Allatoona Lake Study's approval of return flow credit only included those flows returned directly to Allatoona Lake. The Allatoona Lake case, although not a decision or precedent setting, did not involve crediting storage accounts in Allatoona Lake for flows returned downstream of Allatoona Dam.

b. Anderson Joint Regional Water System (ARJWS) (SC) returns only 20 percent of their withdrawals back to Hartwell Lake with remaining amounts into Russell Lake, located south of Hartwell Lake. The net effect is minimal. Even if we provided full credit to ARJWS for its return flows, based on their water demand analysis, it would not change the water supply storage reallocation amount they request. Pioneer Rural Water District (SC) returns only 8.6 percent of their withdrawal back to Hartwell Lake. The City of Lavonia (GA) doesn't return any of their withdrawals to Hartwell Lake but returns flows to Thurmond Lake, located south of Hartwell Lake. Currahee Club (GA) would not return any of their withdrawals since all water would be used for irrigation. There was some discussion concerning a Georgia law that specifically contemplates credits for return flows to a particular user at a project, and that South Carolina does not have such a law that would be applicable to Hartwell Lake. For this case, there is no apparent reason to consider full credit return flows for entities within both states. Meeting participants agreed that the appropriate focus should be on whether we should reallocate storage for water supply, and if so, how much.

c. Balancing three multi-purpose reservoirs as one system for flood control, hydropower, recreation, and the environment along with accounting for water supply

storage reallocation makes for a complex analysis of the systems storage accounting. In addition, the drought plan restricts releases from the system which thereby restricts releases from individual projects to keep those projects in balance. Due to the complexity of the analysis of the system, the current system model does not provide a method of accounting for return flow credits. Therefore, a model would need to be developed to specifically address return flow credit for Hartwell Lake water supply storage reallocations. It would take considerable time to add features to HEC-ResSim to analyze return flow credit. In addition to the extent of analysis requiring an extended amount of time and money, the Corps does not have policy and guidance that requires providing full return flow credit in all circumstances. In many cases, the Corps has not provided direct credit to water supply storage agreement users for returned inflows into reservoir projects.

d. The HQUSACE personnel stated that the Corps is not obligated to model return flow credits in all cases. In this case, using different storage accounting methodologies for different users would become unmanageable. Due to the complexity of the system and the extent of the analysis and its impact on the schedule and budget, HQUSACE did not recommend modeling for return flow credits. HQUSACE counsel agreed with this reasoning to justifying our approach.

e. HQUSACE Counsel asked if there was anything fundamentally unfair or inequitable about applying our current model. The consensus reply was in the negative.

f. The meeting participants agreed to continue to proceed with the Hartwell Lake Integrated Water Supply Storage Reallocation Study without granting return flow credits.

7. Point of Contact: Jeff Morris, Plan Formulation Team Leader, Planning Branch, Planning, Programs, and Project Management Division, 912-257-6507.

KIMBERLY L. GARVEY  
Chief, Planning Branch

MEMORANDUM FOR Mr. Eric Summa, Chief of Planning and Policy Division (CESAD-PDP), U.S. Army Corps of Engineers, 60 Forsyth Street SW, Room 10M15, Atlanta, Georgia 30303

SUBJECT: Hartwell Lake Return Flow Credit In-Progress Review Meeting, 16 December 2022

1. Purpose and Scope: The purpose of the subject meeting was to meet with the Corps Vertical Team (VT) to provide an update on the return flow credit (RFC) modeling, additional funding needs, and associated schedule slip.

2. Participants:

- a. SAS (Kim Garvey, Brian Choate, Suzy Hill, Stan Simpson, Beth Williams, Jamie Sykes, Aaron Wahus, Sandy Campbell, John Moore, Pamela Backus, Spencer Davis)
- b. HQUSACE (Debby Scerno, Charles Moeslein)
- c. WMRS PCX (Meredith LaDart)
- d. SAD (John Ferguson, Daniel Small, William Palmer, Michael Voich)

3. References:

- a. Institute for Water Resources (2021). "Technical Considerations in Storage Accounting for USACE Water Supply Agreements."
- b. Engineering Manual (EM) 1110-2-3600 (2017). "Management of Water Control Systems."
- c. Engineering and Construction Bulletin (ECB) 2019-13
- d. MEMORANDUM FOR Mrs. Susan Layton, SUBJECT: Hartwell Lake Return Flow Credit Vertical Team Meeting, 20 August 2021.
- e. MEMORANDUM FOR Mrs. Susan Layton, SUBJECT: Hartwell Lake Return Flow Credit Vertical Team Meeting, 31 March 2022.

4. Background: The Hartwell Water Supply Reallocation Study is evaluating the feasibility of reallocating existing authorized storage in Hartwell Lake to water supply for four reallocation requests. The four requestors and amounts requested include: Anderson Joint Regional Water Supply (16.05 MGD) and Pioneer Rural Water District (5 MGD), both located in South Carolina; and City of Lavonia (3

MGD); and Currahee Club (0.5 MGD); both located in Georgia. The SAS analysis indicates that this 24.55 MGD request would require reallocation of 20,230 acre-feet of existing storage to water supply storage.

While the VT recommended to proceed with the Hartwell Lake Integrated Water Supply Storage Reallocation Study without granting return flow credits (20 August 2021 memo), South Carolina introduced pending state legislation (approved in April 2022) to require return flow credits to the user's storage accounts. On 22 Feb 2022 the Corps received a letter from Anderson Joint Regional Water Supply requesting return flows. Following a precedent set by the Altoona study and litigation concerns from the State of South Carolina, the VT team recommended on 31 March 2022 to hold the draft report and revise the Hartwell WSRS model (ResSim) to develop the return flow credit alternative before draft release.

Summary of Meeting: The team briefed the attached slides. The team was initially scheduled to discuss the previous nine months since the last IPR held on 31 March 2022. However, the team identified a schedule slip in early December that needed to be addressed. As such, the discussions focused on the RFC model issues that led to delays in completing the Future Conditions with RFC model output, model verification output reviews that were missing from the schedule, and additional funding needs rounded out the IPR. The team anticipates a day-for-day slip, likely 2-3 months, and a \$40k additional cost.

5. Meeting participants made the following observations:

- a. Vertical team provided guidance to Hartwell WSRS PDT on 31 Mar 2022 meeting to hold draft report and revise Hartwell WSRS mode (ResSim) to develop return flow credit alternative before draft release. The Water Supply PCX stated that HQ intention is to entertain RFC alternative, with awareness that there is no standard Corps policy, but it's now a SC state law.
- b. The team was reminded that new environmental justice HQ guidance should be signed any day, which should be addressed in the report. Discussion included that there should be reduced costs to citizens of disadvantaged communities that will be served by water from this reallocation. The team will confirm proper consideration is given to environmental justice, especially regarding public involvement.
- c. The Philpott study cost reduction to requestors is not applicable to the Hartwell study according to the Water Supply PCX.
- d. There will be an ATR of the Hartwell WSRS during concurrent reviews. There will likely be another TSP prior to the ADM.

- e. The level of NEPA for this study is an EA. If alternative 4 is not doable, then it will only need to be included in the EA as an eliminated alternative (thus detailed analysis would not be necessary).
  - f. Based on location, only the inland qualitative tool is necessary for climate change discussions at Hartwell.
  - g. SAD Operations indicated the FY23 Work Plan budget package for this study was increased to \$240k to include the anticipated additional \$40k cost increase, and package is ranked high by SAD. Additional project funding needs were discussed and will be coordinated with VT once updated costs and schedule are finalized.
6. Vertical team recommends confirming the inclusion of the RFC modeling effort with the director of Civil Works and the OASA(CW), validate the new outputs with the PCX, and continue updating the draft report. Four actions items from this meeting are as follows:
- a. PDT complete MFR by 20 Dec 2022, share with VT for concurrence, and then send to DST lead
  - b. SAD Chief of Planning and Policy confirm Director of Civil Works/ASA stance on RFC
  - c. PDT revise schedule and budget
  - d. Conduct "TSP reboot" to make sure all are aligned
  - e. SAD/HQ will assist in finding additional study funding
7. Point of Contact: Kim Garvey, Chief, Planning Branch, Planning, Programs, and Project Management Division, 912-257-5968.

Kimberly L. Garvey  
Chief, Planning Branch





DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS  
441 G STREET, NW  
WASHINGTON, DC 20314-1000

CECW-EC

MEMORANDUM FOR COMMANDER, SOUTH ATLANTIC DIVISION, U.S. ARMY  
CORPS OF ENGINEERS, CESAD-DE, 60 FORSYTH STREET SW, ATLANTA, GA  
30303-8801

SUBJECT: Review of the Dam Safety Action Classification for Clemson Upper  
Diversion Dam (SC02753), Clemson Lower Diversion Dam (SC02754), and Clemson  
Lower Diversion Dam Saddle Dike (SC02754AS1)

1. The Periodic Assessment (PA) for Clemson Upper Diversion Dam, Clemson Lower Diversion Dam, and Clemson Lower Diversion Dam Saddle Dike was presented to the Dam Senior Oversight Group (DSOG) on 18 July 2023 in Fairbanks, Alaska. The Savannah District completed the PA in general accordance with ER 1110-2-1156.
2. A potential failure mode analysis and semi-quantitative risk assessment were performed, and the PA team concluded that the risk due to breach of the Saddle Dike is high.
  - a. The incremental risk is primarily driven by the in-progress internal erosion occurring through the foundation of the Lower Diversion Dam Saddle Dike. Based on additional investigations, seepage analysis, and confirmation of worsening conditions, the Saddle Dike annual probability of failure has increased from the previous risk assessment. Additionally, life loss estimates have increased due to better understanding of the population at risk (PAR) as well as additional development within the inundation area.
  - b. The primary consequence center is Clemson University. The estimated PAR due to dam breach ranges from 1,552 (day) to 167 (night) and the non-breach PAR is zero. The PAR estimates were provided by Clemson University. The estimated incremental life loss for the risk-driver potential failure modes ranged from 10 to 100.

3. HQUSACE endorses the following recommendations:

Dam Safety Action Items

- 2022-SC02754AS01-DS-001: Complete an Issue Evaluation Study (IES) to further evaluate and quantify the existing condition risk.

CECW-EC

SUBJECT: Review of the Dam Safety Action Classification for Clemson Upper Diversion Dam (SC02753), Clemson Lower Diversion Dam (SC02754), and Clemson Lower Diversion Dam Saddle Dike (SC02754AS1)

- 2022-SC02754AS01-DS-002: Prepare a risk communication plan to increase public awareness for the Clemson University community to improve evacuation efficiency.

#### O&M Action Items

- 2022-SC02754AS01-OM-004: Update the Interim Risk-Reduction Measures Plan (IRRMP) for the Saddle Dike based on the results of this risk assessment (Priority Code 2). Per DSOG discussion, an IRRMP for the Upper and Lower Diversion Dams must be developed.
- 2022-SC02753-OM-005/2022-SC02754-OM-016/2022-SC02754AS01-OM-005: Update the emergency action plan in accordance with EC 1110-2-6075 Inundation Maps and Emergency Action Plans and Incident Management for Dams and Levee Systems (1 Oct 2020) based on the results of this risk assessment and improve risk communication and increase public awareness with the downstream community impacted by a breach. Provide local emergency management agencies with updated inundation mapping and EP 1110-2-17 Guide to Public Warnings and Alerts for Dam and Levee Emergencies (30 Apr 2019) (Priority Code 3).
- 2022-SC02754AS01-OM-007: Automate Saddle Dike vibrating wire piezometers (Priority Code 3).
- 2022-SC02753-OM-007/2022-SC02754-OM-018/2022-SC02754AS01-OM-008: Perform instrumentation program review (Priority Code 3).
- 2022-SC02753-OM-008/2022-SC02754-OM-019/2022SC02754AS01-OM-009: Perform crest surveys of embankments (Priority Code 3).
- 2022-SC02754-OM-020: Remediate the unfiltered exit of backfill around pump station discharge pipes (Priority Code 4).

4. The previous PA assigned separate Dam Safety Action Classifications (DSACs) for each of the three Clemson Dams. Since the dams have the same consequence area, they were all assigned the same DSAC during this PA. Based on recent instrumentation data, District-performed seepage analysis, and a detailed review of all project data, the incremental risk has increased for the Saddle Dike from the previous risk assessment. The Saddle Dike is reclassified from DSAC 3 to DSAC 2. Although the risks for the Upper and Lower Diversion Dams have not increased, they are also reclassified from DSAC 4 to DSAC 2. The DSAC change was recommended by the PDT, District and the DSOG.

CECW-EC

SUBJECT: Review of the Dam Safety Action Classification for Clemson Upper Diversion Dam (SC02753), Clemson Lower Diversion Dam (SC02754), and Clemson Lower Diversion Dam Saddle Dike (SC02754AS1)

a. This decision memorandum must be attached to the front of the report, which contains the supporting information, and the complete report must then be uploaded to the Corps of Engineers Dam and Levee Safety (CE-DALS) ProjectWise Datasource.

b. The National Inventory of Dams (NID) Program Manager must update the NIDs to reflect the new DSAC assignments and DSAC assigned dates.

c. An IRRMP must remain in-place for the Saddle Dike and an IRRMP must be developed and implemented for the Upper and Lower Diversion dams.

5. The incremental risk posed by the projects is not tolerable. To reduce the risk to tolerable levels, the following actions need to be taken.

a. Further evaluate and quantify the existing risk, per action DS-001

b. Improve risk communication with the public and stakeholders, per action DS-002.

c. Update and implement IRRMP.

6. The point of contact for this memorandum is Mr. Jacob Davis, P.E., HQUSACE Special Assistant for Dam Safety, at (202) 761-4643 or Jacob.R.Davis@usace.army.mil.

TRAVIS TUTKA, PE  
Deputy Dam Safety Officer  
US Army Corps of Engineers

CF:

CECW-EC (Davis, J., Townsley, S.)

CECW-SAD (Wilcox, S.)

CESAD-RBT (Smith, C., Sutter, A.)

CESAS-Z (Geary, J.)

CESAS-EN (Hendren, T.)

CESAS-ENH (Wimberly, L.)

CEAGC-GSS (Ragon, R.)

CELRH-DSPC (Whitmore, D., Maxey, D., Sawyers, D)

CEIWR-RMC (Snorteland, N., Williams, C., Best, B., Mahoney, M.)